THE MODEL HEALTH SHOW

EPISODE 526

The Science And Safety Of Surgical, Cloth, And N95 Masks

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SHAWN STEVENSON: Welcome to the Model Health Show. This is fitness and nutrition expert, Shawn Stevenson, and I'm so grateful for you tuning in with me today. On this episode, we're going to be diving into the science and safety of surgical masks, cloth masks, and N95 mask. This has become a very contentious issue in our world today. So I want to create a real resource, a database of peer-reviewed evidence, and remove the stigmatism from it, remove the dogma from it, remove the highly emotionalized tendency from the data, and just look at this through the lens of science, to be able to zoom in and look at places that we need to look into, and also to be able to zoom out and take a meta-perspective.

So, I've been working on this for the past few months, and it's a tremendous amount of data. And again, I wanted to create a real viable resource for you, that you can share with your friends and family, that you can share with your local politicians. And again, we're just going to stick to the science. Now, contrary to popular belief, there is actually a tremendous amount of peer-reviewed evidence, specifically randomized controlled trials looking at the efficacy of various types of masks in reducing the spread of infectious diseases, prior to the advent of COVID-19 being such a big part of our lives. And one of the best studies, and this was actually published in a prestigious peer-reviewed journal, the BMJ, and this was titled A Cluster Randomized Trial of Cloth Mask Compared with Medical Mask in Healthcare Workers. Now, this is looking at a total of 14 different hospital settings and over 1600 health care workers. It's a pretty good sample size.

Now, this study randomized the participants into three specific arms of the study. One arm used medical mask or surgical mask at all times on their work shift, while the second group wore cloth mask at all times on their work shift. And the third group, which was the control group, which were allotted to do standard practice, which may or may not include mask use, which we're going to talk a little bit more about that in a moment, but this is our control group. And again, this was a really well-done study under these conditions, where we have a lot of moving pieces. And obviously, face mask use is a visible intervention, by the way, so this points to the fact that this can't necessarily be a blinded study in the arena where it's taking place. But the laboratory results were blinded, and laboratory testing was conducted in a blinded fashion. Again, this is a pretty well-done study.

Now, here's what the study revealed. The main outcomes measured in the study were clinical respiratory illnesses, influenza-like illnesses, and laboratory-confirmed respiratory virus infections. And the results of the study found, the rates of all infection outcomes were highest in the cloth mask group, as compared to the control arm and compared to surgical mask. In fact, healthcare workers who were wearing cloth masks were 13 times more likely to

experience an influenza-like illness than those wearing medical masks aka surgical masks. Right now, I highly encourage that if you're listening to the audio version of this, definitely check out the video version of this episode, so that you can see everything first-hand, you can see the graphs because truly, when it comes to such a contentious issue like this, seeing is often believing. So again, not two times, not five times, but 13 times more likely to experience an influenza-like illness when wearing a cloth mask.

Now, this study is the first randomized controlled trial of cloth mask indicated, and the results from the researchers actually caution against the use of cloth mask. This is an important finding that should be used to inform occupational health and safety, especially in this clinical setting, but also stretching that out into the population because now, a lot of folks are using cloth mask as a go-to when we're seeing such higher rates of infection. And the researchers were trying to really figure out why this was happening. And they said, "Moisture retention, reuse of cloth mask and poor filtration may result in increased risk of infection. Further research is needed to inform the widespread use of cloth mask globally. However, as a precautionary measure, cloth mask should not be recommended."

Alright, so this is the outcome from this, again, peer-reviewed, randomized controlled trial that took place before all this madness in the world, where folks were a little bit more logical in looking at some of these data. And so, I was sharing this at the very beginning and saying, "Hey listen, at least let's acknowledge that wearing cloth mask might be actually leaning towards increasing the rate of infections," and not just advocate because we got to this place where health officials were saying, "Hey, wear anything. Anything can help. Take a handkerchief out of your pocket, take some old underwear, cut it up. Whatever it takes, just wear something. Anything helps." When in reality, if we look at the data, that's not a logical statement, to say something like that. And what if we're putting something on our face that might be exacerbating the spread of infectious diseases? As crazy as it might sound, based on our biases, but this is what this particular peer-reviewed, randomized controlled trial indicated.

Now, another point of emphasis for this particular study, that people who were just looking to affirm what they already believe, they're going to come back and say, "Well, the control group wasn't people who didn't wear a mask." So, we don't know if wearing a mask is going to be effective in this particular clinical trial, versus not wearing a mask. But what folks fail to realize is that, yes, this control arm was given standard practice where they can wear a mask in situations that they deem to be necessary. But if you actually look at the compliance in the study, there's a compliance outline, there's a detail, there's a graph on this.

Compliance was actually significantly higher in the cloth mask arm and the medical mask arm compared with the control group. The control group, literally less than half of the time compared to the other groups, wore masks. And the data clearly shows that. And actually

again, you have to see this graph to believe it. They were just not very compliant in wearing a mask very often. So, this is starting to lean into looking at, "Hey, what about these folks that aren't wearing a mask or aren't wearing a mask very often, versus these two interventions?" And we can start to extrapolate some insights from this.

Now, this is also important to note. Yes, the rates of influenza-like illness were substantially higher in the cloth mask group compared to the surgical mask and control group who had, again, significant lower mask compliance. But this is important as well. Analyzing the effectiveness of both types of masks as well as the control group against clinical respiratory illness, and against laboratory-confirmed respiratory virus infection, the researchers stated, "Outcomes were not statistically significant between the three arms."

Now, this should be the takeaway from a study like this. We've got two things. If we're looking at influenza-like illness, cloth mask can actually potentially increase the risk of infection. But overall, if we're looking at the other things that were tracked, which was again, clinical respiratory illness and laboratory-confirmed virus infection, the outcomes were not statistically significant with any of them.

Now, another interesting aspect of this study. Hey folks, again, one of the big issues today is that people are window shopping. They're skimming, they're looking for headlines, they're looking for bits and pieces of data. And there's this term called cherry-picking. But folks who tend to cherry-pick are the ones who likely tend to point cherry-picking out in other people, when in reality, especially with such a contentious issue, we have to cross our T's and dot our I's. We need to really analyze the data. We really need to sit with it. We really need to play this out and look at things from different perspectives. And if we're not doing that, we're just going to continue to affirm our own biases.

And so, for myself, coming into it, I'm looking at number one, "Which masks are going to be effective?" because it seemed pretty logical that having some type of facial covering is going to help to stop the spread of droplets, and aerosols, and potentially viral infections like we're going to be talking more about. But I just thought it was a little bit logical. But also, I know that we're venturing into the realm of something that is abnormal for a human design to do something like that. So, I want to make sure, "At what point do we start to see diminishing returns? At what point do we see that there might be any negative side effects?"

And so, these are all questions that I had as I went into the data, not looking for mask to be bad or good, or effective or ineffective. I'm just looking for logic, I'm just looking for truth. And that's what we should all be concerned with, being able to have rational healthy conversations about these things, because this issue truly has shifted our world. This is why I want to create a focused resource for you on this subject.

Now again, digging in deeper into this well-done clinical trial that we have, here's another aspect that's easily overlooked. The researchers stated that adverse events associated with face mask use were reported in over 40% of healthcare workers in the surgical mask arm, and in over 42% of healthcare workers in the cloth mask arm, ranging from general discomfort to breathing problems. So nearly half of the healthcare workers in both groups experienced some form of adverse event. And just to give a preview of what's to come, when we have these adverse events from putting these things on to our bodies, it's an indication our physiology is giving us symptoms in response to something. And it is evoking a stress response of some form.

Now, does that balance out against reducing the risk of these particular infectious diseases on everybody's minds? Well, we have to see. We have to actually take a rational cost-benefit analysis to truly understand. So, the researchers stated, "We've provided the first clinical efficacy data of cloth mask, which suggests healthcare workers should not use cloth mask as protection against respiratory infection. Cloth mask resulted in significantly higher rates of infection than medical mask, and also performed worse in the control arm. The controls were healthcare workers who observed standard practice, which involved mask use in the majority, albeit with lower compliance than the intervention arms, the control healthcare workers also used medical masks more often than cloth mask."

Now, here's another really interesting thing. Again, this was done prior to all that's happened in the world. The researchers stated, "Observations during SARS... " and they're referring to SARS COV-1, "Observations during SARS suggested double masking and other practices increased the risk of infection because of moisture, liquid diffusion and pathogen retention." This double masking phenomenon, it's not new. This was something that was tested for by researchers, prior to this being a part of our lexicon. Alright? And finally, the researchers stated again, "Moisture retention and poor filtration may result in increased risk of infection with cloth mask, and that cloth mask should not be recommended."

Now, let's pivot to look at why is this happening. Their hypothesis is that moisture retention and kind of being a vector for pathogens could be a reason why cloth mask are increasing the risk of infection. Well, a 2015 study conducted by scientists at Oxford University found that "The accumulation of moisture during prolonged usage may exacerbate this problem by increasing resistance to airflow. Moisture accumulation is also thought to facilitate the movement of contaminants through the material of the mask itself." Now, this is happening in multiple types of masks. We're analyzing the efficacy of the three main types of masks that folks are aware of today, being cloth mask, surgical mask i.e. Medical mask, and N95 mask.

So again, this study is seeking to explain what's happening when masks are worn for a notable amount of time, how it can start to have diminishing returns, and possibly create a higher risk of infection. Now, at the end of this episode, we're going to cover what we can actually do with this information, because this is again, a very hot topic and something that has in many senses created this divide and this politicization of an issue that should be focused on human health. But the health aspect has largely been removed from it, and it's been more about dogma, and a little bit more about pre-conceived notions, and a lack of actually looking at and understanding real peer-reviewed evidence. So again, at the end of the show, we're going to talk about what we can actually do with all this data.

Now, we're going to move on to a meta-analysis of 19 randomized controlled trials, alright? 19 randomized controlled trials, these are really the upper echelon of peer-reviewed studies. We'll talk more about the distinction of randomized controlled trials, versus everything else coming up in a bit. But this is a very good data set for us to extrapolate some information from. Now, this was actually compiled post-COVID-19 hitting the scene but gathering data that was already present from years of, again, randomized controlled trials. And this was published in the International Journal of Nursing Studies, and it examined the effectiveness of mask in reducing infections in eight community settings, six health care settings, and five as source control. And we'll detail what all of these are.

Now, we're going to go through what the researchers stated, and then we're going to dig in and really help to make sense of this, because this particular study can easily be confusing even for folks that are well-versed in understanding peer-reviewed evidence. So, the researchers noted that a total of 19 randomized controlled trials were included in this study. Most of these randomized controlled trials used different interventions and outcome measures. In the community, mask appeared to be effective with and without hand hygiene, and both together are more protective. Randomized controlled trials in healthcare workers show that respirators, which are N95s, if worn continually during a shift were effective, but not if worn intermittently. Medical masks were not effective and cloth mask even less effective, when used by sick patients. Randomized controlled trial suggested protection of well contacts.

Now, we've got a mixed bag of data here, where it looks like we've got some effectiveness with mask in the community settings, but not in healthcare settings. And so, we're going to, again, break this down on what it actually means, but I also want to note... And this is the thing, we have to be okay with whatever the conclusion is. That's the thing, we've got to be able to put our biases to the side and actually look at the results. Now, this particular conclusion of the study, which again, we're going to break down all these pieces, we're going to actually look at these references, the conclusion of the analysis states the study suggests that community mask use by well people could... Keyword could... Be beneficial, particularly for COVID-19, where transmission may be pre-symptomatic.

Now again, this could be very confusing if you're not putting your biases to the side, and cross-referencing things, and being aware of the intention of the humans who are putting the data together here, because this is an instance where a bias can cause you to only see what you want to see, as you're going to find out. And the only real definitive language here in their results came in the form of medical mask being not effective and cloth mask being even less effective. Everything else was a lot of could and maybe. And now you're going to see why.

So, if you're watching on the video, we're going to actually go through and look at the references from each of these data sets. And of course, we're going to go along with it here, if you're listening on the audio version. We're literally going to go step by step with their references. So, the first set of references, we're looking at the community mask trials. Again, they said in the results that in the community, mask appeared to be effective with and without hand hygiene. So now we're actually going to look at their references. Where did they get that conclusion from? Where did they get those particular results?

So, we're going to go and cross-reference the data. Alright, this is a very important thing to do, again with a very contentious subject, let's actually go and look at the specific studies that they used to come to this conclusion. Now, right off the bat, if you're looking at the video, you're going to see that the first reference that was published in 2008 by Cowling & company, again, randomized controlled trial, peer-reviewed published study, found when it comes to mask effectiveness in the community, their conclusion was NS or not statistically significant. There was no statistically significant finding with this mask intervention. That's the first of these community mask trial references that was used to come to the conclusion of the overall paper.

Let's move on to the second one. This one was by MacIntyre and company in 2009. Their result, the mask intervention was found to be, again, not significant. And it's right there in the references, if people care to actually look at them. Let's move on to the next of the references here. This was by Cowling & company in 2009. And so, Cowling came back. Their team had a study published in 2008, they did another one in 2009. Their results stated, "Not significant. Mask plus hand hygiene protective against lab-confirmed influenza if used within 36 hours." Now, this seems a bit confusing. So, we've got not significant, then we've got mask plus hand hygiene protective against lab confirmed influenza if used within this particular day and a half time frame.

Let's look at the study itself, and this particular study was published in the Annals of Internal Medicine. And the study stated, "Hand hygiene, with or without face mask, seemed to reduce influenza transmission. But the differences compared with the control group were not significant. Also, "Interventions were implemented within 36 hours of symptom onset, and the

index patient transmission of RT-PCR confirmed infection seemed reduced." And this is one of their overall assessments, "Adherence to the interventions varied. We observed contamination between groups because both interventions were practiced to some degree in the control group. Only half of the index patients in the face mask plus hand hygiene group reported regular use of the surgical mask during the follow-up.

So only half of the people did what they were supposed to do. And face mask adherence among household contacts was lower. So, some of the people in the control group wore mask and washed their hands frequently. In this study, really muddying up the waters, and nearly half the people in the mask group actually wore their mask. So, this particular study is really not that well done. It doesn't come to a lot of viable information. That's why I wanted to take a moment and to examine it more to maybe extrapolate like, hey, this study overall, this meta-analysis of all these studies saying that community mask use was effective, maybe we can pull some effectiveness out of that study. But again, it doesn't really seem like it.

Let's move on to the next reference here, and this is from Aiello and company in 2010. This particular study was published in the Journal of Infectious Diseases. And the results stated, "Intention to treat non-significant, non-significant results. Yet again, mask plus hand washing protective in week 4-6 of observation and beyond. So, this is a conflicting statement again. So, let's take a look at the study. The results of the study state, "We observed significant reduction in influenza-like illness during weeks four through six in the mask plus hand hygiene group, compared to the control group." That's strange, in weeks four through six. Why not weeks one through three?

Face masks alone... Again, listen to this part. Face masks use alone showed a similar reduction in influenza-like illness, compared to the control group, but adjusted estimates were not statistically significant. Neither face mask use and hand hygiene nor face mask use alone was associated with a significant reduction in the rate of influenza-like illness cumulatively. It's not looking good, the references saying that mask use was effective in the community. Every reference that we're looking at is not actually saying that mask use was effective in the community.

Let's take a look at the last couple of references here for the community setting. The next one was Larson and company published in 2010, and this was published in Public Health Reports. And the researchers stated that mask plus hand hygiene plus health education protective against secondary transmission, measured by confirmed influenza and influenza-like illness.

Now, taking a peek at the study itself, the researchers come to the conclusion that mask are protective despite there not being a mask only group in the study, and despite... This is important, there wasn't a mask-only group in this study, and despite the acknowledgement

that, "Compliance with mask wearing was poor." Now, again, there's some conclusion here that there was some efficacy found, but the data is so contradictory in the study itself, we can't say for certain if this is going to be a viable study to actually demonstrate efficacy of mask in the community.

We've got Simmerman and Company published a study in 2011 and the researchers concluded no significant difference in confirmed influenza infection, yet again, Suess and Company in 2012, again, the results of the intervention with mask were found to be non-significant, now, we just went through all eight references for mask efficacy in a community setting. What did you notice? What was the consistent trend? What did you hear most often? Not statistically significant. Over and over and over and over again. What we're doing here right now, this is science, this is examining the evidence and coming to a rational conclusion, not a single one of these studies that was proposed to demonstrate mask use being effective in the community settings, even remotely demonstrated significant efficacy.

That's not my opinion. That's what their own data shows, if it was different, that's okay, I'd be all for it. I'd be wearing a mask right now on this show. But that's not what the data indicates, so at least to record this, I'm not mask bound. And realistically speaking, even if we could fight and claw and try to find some small instances of efficacy in mask being protective in that series we just went through, the majority of the studies say point blank, they are not effective and or they have no significant benefit. Right, so that's for the community setting, obviously this meta-analysis of all these different randomized controlled trials looked at multiple settings, so that's the community setting, and the crazy thing is, again, the researchers who put this information together, once COVID hit the scene, they stated that in the community, mask appeared to be effective with and without hand hygiene. And that's simply not true. I don't know why they did that or what they were thinking, but that demonstrates to me, researchers coming in with a strong cognitive bias and looking for things that aren't actually there or ignoring things that don't fit their belief system, and to be a good scientist you've got to be able to check your biases at the door and look at the data like a logical rational human being and be willing to be wrong as well.

So now we're going to take a look at the health care setting in this big meta-analysis of multiple randomized controlled trials. Now, the first one was published in 2009 by Jacobs and Company, and it was published in the American Journal of infection control and the benefit of mask in this trial, as the report states, it's NS or not statistically significant. Again, taking a peek at the actual study, the study states, "Face mask use in healthcare workers has not been demonstrated to provide benefit in terms of cold symptoms or getting colds." That conclusion is consistent with the findings of most of these references that you're seeing, but here's another interesting observation, when they tested for it in this particular study, not only were the masks not effective but, "Subjects in the mask group were significantly more likely to

experience headaches during the study." Now, obviously, common causes of headaches in this particular context where we have an intervention, where we have something covering our breathing pathways, this could be ranging from... If we're talking about the cause, because that's the symptom, anywhere from excessive stress, impacting the nervous system and or the endocrine system to abnormalities in oxygen exchange to acute inflammation. We can't really identify what the root cause is in the particular patients or the particular participants.

But we can start to question, they're having the side effect of a headache, what's the underlying issue? Is this intervention hurting them? And how serious is it? Now, moving on to the next reference, this is published in 2009 by Lobe and Company, and it pitted surgical mask versus N95 mask without any control group and found, "No significant difference between surgical mask and targeted N95 mask." That's interesting, because N95s are really touted to be superior to surgical mask in this context, and we're going to talk more about that, but here in this instance, they found no significant difference between the two. Moving on to the next reference published in 2011 in the peer-reviewed journal Influenza and Other Respiratory Viruses by MacIntyre and company found continuous N95 protective against clinical viral and bacterial end points.

Alright, we got something that is demonstrating some effectiveness here, let's take a look at the study itself, now this was primarily a comparison of medical masks versus N95 mask versus fit tested N95 mask. Alright, so we don't have a control group here that's not masking. So, when we're saying we got some effectiveness, effectiveness versus what? We're just looking at effectiveness within the triage of mask interventions, the primary findings looking at clinical respiratory illness, influenza-like illness and laboratory confirmed respiratory virus infections were, "Non-fit tested N95 respirators were significantly more protective than medical mask against clinical respiratory illnesses, but no other outcomes were significant."

So, one out of the three were significant, right. Now, just to be clear, this was a non-fit tested N95 demonstrated more effectiveness than the surgical mask, just in one out of three categories. Again, this is great, this is great. N95s were found to be effective against clinical respiratory illness, in fact, they stated, "Rates of infection in the medical mask group were double that in the N95 group." That's a pretty big statement but keep in mind, the results of the N95s were not statistically superior to surgical mask against influenza-like illness and laboratory-confirmed respiratory virus infections according to the researchers here. And something else interesting in this trial was that, "There was no significant difference in outcomes between the N95 arms with and without fit testing." This is a very, very important takeaway from this particular study, again, if we're looking at the data, a lot of folks believe that the fit-tested N95 is going to be far superior than the non-fit-tested N95, but this randomized controlled trial says otherwise.

How many randomized controlled trials do we have that actually demonstrate that fit-tested is superior? So that's something to keep in mind because we do have some evidence showing that it doesn't make a difference. Now, another reference, which is a similar study from MacIntyre and Company in 2013 published in the American Journal of Respiratory and Critical Care Medicine, this time adds in targeted use of the N95 compared to medical mask or continuous use of the N95. So, we got targeted use of the N95, where the health care workers putting on the N95 just in situations where they feel are necessary and then not having it on other times, you got continuous use of the N95 in this trial, and then we've got surgical mask. Here's what the study states, "Continuous N95 use seems to be protective but there were no difference between targeted N95 and medical mask." One other interesting finding here was that although there appeared to be no difference between targeted N95 and the surgical mask group, listen to this, "The surgical mask group had significantly more bacterial colonization happening in their respiratory tract." What's up with that? What's up with that?

Now we're going to move on to the next reference here, this was another one from MacIntyre and Company, they keep coming back, they just keep studying mask. They've been studying mask for years. We should probably listen to them. This was published in 2015, and this is actually our very well-done study that we've already covered at the beginning of this episode, published in The BMJ looking at the effectiveness of surgical masks versus cloth mask versus the control group that had very low mask compliance compared to the mask groups. All right, so MacIntyre just cracked the code, they came up with something really viable, finding again, that with clinical respiratory illness and laboratory confirmed respiratory virus infection, the effectiveness of surgical cloth mask and the control group using general practice with substantially lower mask wearing compliance, "Outcomes were not statistically significant between the three arms." But the standout outcome from that study again was people wearing cloth mask were 13 times more likely to contract an influenza-like illness than people wearing surgical mask and also significantly higher than people in the control group who had very low mask compliance.

So using this study as a reference for this meta-analysis, again, what we're looking at is the references in a meta-analysis of 19 randomized controlled trials published in the International Journal of Nursing Studies, this study that we just mentioned published in The BMJ, the one that we mentioned at the top of the show and went through, this is probably the reason that the researchers here in this particular meta-analysis stated that medical mask were not effective and cloth mask even less effective. Alright. Medical mask not effective, cloth mask even less effective. So, if something's not effective, we'll just say that it's zero, less effective than not effective, that's like negative, right? So that's like, this is a problem. If we really look at this rationally, how can something be less effective than not effective? That sounds bad. Alright, so we've got one more reference here for healthcare settings, this was published in 2019 by Radanovich and company published in The Journal of the American Medical

Association. They stated, "Among outpatient healthcare personnel, N95 respirators versus medical mask as worn by participants in this trial resulted in no significant difference in the incidence of laboratory confirmed influenza."

Are you seeing the trend here again and again and again, the study's owned language, no significant difference, no significant difference. And so, to outwardly state otherwise, after examining all this data, again, something doesn't really add up. Now, we've got one more data set to look at, so we looked at the community setting, we looked at the healthcare setting, now we're going to look at the final data set, which was source control mask trials. In this instance, source control refers to the use of masks to cover a person's mouth and nose and to help reduce the spread of large respiratory droplets to others when the person talks sneezes or coughs. So, it's controlling the source of where it's coming from, and it appears to be obvious that blocking one's mouth and nose would prevent the spread of bacteria, viruses and other microbes. It just seems logical, right? But here's the thing, these entities, if we're talking about bacteria, viruses, fungi and other microbes, these entities don't really operate on the obvious, and that should be obvious today more than ever, in fact, they operate in a way that defies surface level logic altogether. In reality, the actual size and capability of a bacteria or virus would shock a lot of people if they take the time to really think about this and kind of imagineer what this looks like.

So, we'll just use the size of a human hair for comparison, a single strand of human hair is about 80 micrometers in thickness. Okay, so 80 micrometers, it's so tiny, it's measured in micrometers to get to the size of a single bacteria, you have to divide the width of a hair by 40, because a single bacteria cell is just two micrometers in width. So, it's very, very small. Now, here's where it gets really uncanny is when you look at the size of a virus particle. A virus particle is actually too small to be measured in micrometers, they're actually measured in nanometers. And at the size of about 17 to 140 nanometers, you can actually fit hundreds or even thousands of virus particles into a single bacteria cell, again, thousands of viruses can fit into one single bacteria. These pathogens are inordinately small, and the protective pore size of conventional cloth and surgical mask are literally gigantic, they're ginormous compared to viruses.

Now, the potential benefit of a mask is centered on the very limited hypothesis that if we simply attempt to block aerosols and droplets from coming out of the human body, you can stop the spread of infectious pathogens. I said hypothesis intentionally, because again, we're going to look at how this actually works out in reality, because these are source control references, these source control references in this study are looking at the superficial observable control of aerosols and droplets, but it's not nearly as relevant or valid in establishing the clinical end points of whether or not people get sick, that's the thing, that's what's missing. So, we got to keep this in context, source control matters, but does it actually

stop people, stop other people from getting sick. Now, right off the bat, one of my issues that I would like to bring forward is the tendency to ignore basic laws of physics when it comes to speaking into a mask, coughing into a mask, etcetera. In particular, we're talking about the majority of masks that folks are using are cloth and surgical mask. And what happens when you're talking, when you're coughing, sneezing, etcetera, there is a tremendous amount of aerosols and droplets that are spraying above the mask, under the mask, out the side of the mask, and yes, a notable amount of projections go through the mask, especially if worn for longer periods.

And not to mention the trillions, trillions of virus particles that are literally just teeming on your body, if somebody's got a mask on, all over their face, all over their skin, in their hair, in their clothes. You're walking around like Pig-Pen from Charlie Brown, you've got a cloud of viruses that are just... They're just always hovering around you, these facts of reality seem to be completely ignored when looking into this very contentious issue, but that's how physics work, and also understanding that when we place this object over our breathing pathways, they do in fact become a traveling vector for pathogens. And that's just what it is. It becomes pretty... We're creating a micro-habitat on our face and within this mask and it's... We're moving throughout the world with it and stuff is going to get pushed through and there's going to be an interaction with other things in the environment, and we're all just carrying around this potential litter box to give an analogy for waste products for... Because here's a thing, bacteria make waste too, even the bacteria that we have within the human body, they're doing a lot of things that our body overall does, they're replicating, creating their own waste products.

So again, we're talking about a pretty nasty scenario that we're just kind of carrying around with us, rather than it being dispersed into the environment, which is how we evolved as a species, so this is a new intervention, it's something new that we're experimenting with and we're trying to look again, logically, is this actually effective? To what degree is it effective? And what are the potential detrimental or downsides of this intervention? But we're looking at source control right now, we're looking at what are the results? So, let's put basic physics and logic to the side for a moment, just look at the results in these source control references in the study. And here in the first source control reference, we have a study published in 2009 by Johnson and Company. And first and foremost, you got to understand, this is not based on real world human-to-human confirmations of viral transmission, it's just having people cough into a petri dish. That's where we're at right now. Their conclusion, "No significant difference between surgical mask and N95 mask, they're equally effective when coughing into a petri dish." That's good to know. Let's move on to the next source control study, and this one was published in 2010 by Canini and Company, and it was published in PLOS ONE. And it states, "In various sensitivity analysis, we did not identify any trend in the results suggesting effectiveness of face masks."

Again, we're looking at source control right now, we're looking at source control, and here's another study finding no effectiveness with face mask. Let's look at the next reference under source control. This was published in 2016 by MacIntyre and Company. This was published in the British Medical Journal, the BMJ. Now, if you actually look at the study results, it says, "In an intention to treat analysis, rates of clinical respiratory illness, influenza-like illness and laboratory confirmed viral infections were consistently lower in the mask arm compared to the control group. Although not statistically significant, a post-hoc comparison between the mask versus no mask groups showed a protective effect against clinical respiratory illness but not against influenza-like illness and laboratory confirmed viral respiratory infections." This is good, we've got a little bit of efficacy here with mask versus a control group in this context. Again, the results were not statistically significant, but we got something. The next source control reference was published in 2014, we've got Barasheed and company putting masks on a tiny group of pilgrims and no mask on other pilgrims. Again, this is a tiny data set. They stated, "Laboratory results do not show any difference between the two groups."

Here we are at the final one of our source control references published in 2020 by Long and Company. Again, is not... This one, listen, it's not based on real world human to human confirmation of viral transmission, it is just having people cough into a collection device. Here's what the study found. "Coronavirus found in exhaled breath of no mask subjects, but not in mask wearers." Again, they were using a collection device, where it's directly in front of them, having them cough a few times to get this particular result, or this particular outcome. It's not accounting for basic real-world scenarios like the diminishing returns based on duration of the time the mask is worn. The droplets and aerosol spraying out the sides of the mask, and the most important factor, which is, do you actually see other people getting sick when wearing a mask versus not wearing a mask. Now, based on the data that we've already covered to reference, this study is just grasping for branches because nearly every one of these references that we've covered, we've literally gone through every single one of these references in this meta-analysis, nearly every one of these references concluded some version of no significant difference.

So how on earth do you get to a conclusion where the researchers doing the meta-analysis state that, "The study suggests that community mask use by well people could be beneficial particularly for COVID-19 where transmission may be pre-symptomatic." How do you get to that conclusion? Based on your own data, that's not good science, that's not ethical. The data doesn't say that, in fact, it says the opposite, and we have to stand for logic, we cannot solve these issues if we're not being logical. And so, now here again, I want to reiterate this, if it was reversed, I would care not as a scientist and a logical human being, if the data says that mask are doing all these wonderful things from what we just covered. Amazing. Mask it up. Wonderful, but that's not what the data says. And we have to have the intelligence to

acknowledge that. Again, this is an instance where a bias will cause even well-meaning researchers to see what they want to see and not actually see what's present in reality.

Now, we've got to ask ourselves, where are we doing this in our own lives? Right now, there's a lot of things that are separating us, that they're dividing us, that can seem very logical from both camps, because people who are very strong advocates for masks and touting studies that masks... They'll just say the data is clear, it's clear that masks are effective. They truly believe that, and they think that the other group is completely illogical. For me, I'm sitting here in the middle of the balance beam just looking at the data. That's all I care about and doing what's most effective and efficacious for our citizens. Now, where do folks get this idea that masks are incredibly effective and that the results are clear, this is one of the things that you hear on major media, health officials, masks are clearly effective. Studies show that masks are clearly effective, what studies were they using? So, let's take a look at where this information is coming from, because what we just covered are randomized controlled trials. So now we're going to dive in and look at things that are not top tier because randomized controlled trials are a top tier as far as peer-reviewed evidence, as far as the structure of scientific method, randomized controlled trial. We'll break down a little bit more what that is, but I just want to give you a heads-up as to what kind of data people are...

Getting to make them think otherwise, because for whatever reason, health officials are acting like these real-world randomized controlled trials that we've just covered, don't exist. They existed at the very beginning of all this stuff, and I was sharing the data again from a non-biased position, because I reserved my bias.

But once I know the data, of course, I have my... I'm a human and I understand like, oh, wait a minute we might be going in the wrong direction, why are we not looking at this. Cloth masks are clearly problematic if you look at the data, why is everybody... Why are they telling people to work cloth mask?

That's not ethical. And so, once I understand the data, reserve my biases, now I can kind of step into a more clear conclusion, but for whatever reason, again, health officials are acting like these real-world randomized controlled trials don't exist and instead they keep referring to observational studies. Observational studies by their very nature are unreliable and unclear and open to a massive amount of biases and confounding factors. There are no specific interventions that are being employed, there's not a specific intervention being done, and you're not tracking for a specific outcome. It's just observing. We'll see what happens, maybe there this little sprinkle of this over there, little sprinkle of that, we don't know we just observe, we see what happens. And so, you can literally just come up with things that sound good, really with observational studies. Now, here's the thing, an observational study can yield some great hypothesis that we then go and test with a randomized controlled trial. But an observational

study in and of itself, if we have the opportunity, we cannot put that above randomized controlled trials, we just can't do that.

And so, we have health officials deferring to observational studies and also theoretical models. Key word theoretical, not real-world based on actual real-world occurrences but theoretical models that continue to make generous assumptions in their design. One such analysis that made tremendous amount of headlines in June 2020, was conducted by researchers at Texas A&M, declaring that face masks prevented more than 66,000 infections in New York City in less than a month. The lead researcher stated, "By analyzing the pandemic trends without face covering using the statistical method and by projecting the trend, we calculated that over 66,000 infections were prevented by using a face mask in little over a month in New York city." Yet again, if you actually read the study, it's a study affirming how droplets and aerosols travel, which we already know, it's not a study on mask effectiveness, it's not. It's not actually using mask as an intervention anywhere in the study.

Alright, this is a theoretical model based on the movement of aerosols and droplets, which again, this study claims that masks prevented 66,000 infections based on assumptions. Why do we not have a serious problem with that? Assumptions of universal consistency and mask quality because all these people that it's saving, were assuming universal mask quality, universal mask fit, duration of time worn, assumptions about the wearers that they're not touching their face and that the aerosols and droplets are being deflected and sprayed all over their face and clothes and creating clouds of droplets from above and below and through the side of the mask, we have all of these assumptions.

That's not science. That's not science. We can assume to the end of time, but we've got to be able to actually look at reality what's happening in the real world. Because they're also assuming that the masks are effective in the first place, they're not testing it in their study, they're assuming that masks are effective in the first place, which we just went through randomized controlled trials, we just went through a lot of them. The vast majority of real world clinical trials that we've covered show that they're not. They're assuming that they are. It's not based on the data, the real-world data that we have. Again, this assumption, this assumption of universal conditions is not how science works, and it's not how viruses work in the real world. Statistical modeling is a tool, it's a tool. Not the tool. The model is only as good as the assumptions put into the model as well, so 66,000 infections prevented, I mean come on, that's just not... It's not based on reality. And again, statistical modeling can be an effective tool for sure, but it is a tool, it's not the only science and by far, again, the model, the statistical model is only going to be as good as the assumptions that are put into it.

And by the way, if you actually look at their graph in this particular study, their gross estimates also fail to differentiate the effects that shelter in place and social distancing mandates had

versus wearing masks in public, in fact, infection rates were already trending down when the stay at home order mandates were in place, and this suddenly gives unsubstantiated credit to the face mask, which again, you see the trend going down and that's already taking place, but here's the thing, this is the point, because even that, that still can be debatable, but here's the point, even with the masks mandates being firmly in place and you see this trend going down, and this is... They're firmly in place in NYC high level of compliance.

We know what happened after this report was published, the cases of COVID-19 exploded again, they skyrocketed yet again. Alright. So, this was like grabbing this piece of data out of a moment in time and say, hey look, we implemented the mask mandate here, the trend is going down, but then what happened, well, guess what, you don't hear about this study anymore, it was getting passed around, health officials were citing this study, my friends and colleagues were sitting this study, and now it has been completely disappeared from the conversation. There is been a hit man sent out, took it out, it no longer exists. But, with the internet, it lives on, especially again, make sure that you're watching the episode, the video version at themodelhealthshow.com/maskscience.

Alright. It's going to be exclusive on that platform, again, being that it's such a contentious and debated topic with a lot censorship surrounding it, unfortunately, just talking about real world peer-reviewed evidence and sharing the science, unfortunately, it's a crazy time that we live in where this information gets suppressed and gets censored because in truth, when I share this data initially, and it was something that I invested a lot of time and energy and resources into, YouTube, which is one of the biggest platforms in the world, we're not just talking about for video, but just as a search engine, the video itself was well-produced and it had all this incredible peer-reviewed evidence, and it was about a 51-minute video, 50 something minute video, within about 20-30 minutes, YouTube took it down. They clearly, they didn't even look at the data, they didn't... It was really heart-breaking for a moment, but then it just inspired me even more because right now we have an opportunity to look these situations in the face and to say no, I will not allow my voice to be silenced, to get more creative and more supportive and affirmative, to find creative ways to reach people and to get this information out into hands of more folks.

Also, about a month ago, I received a notice that another video that I took time to be very careful about, in my dictation of the data and publish it on YouTube, was one of our biggest videos where I kind of sandwich this data into an episode and sure enough, it was up for about a year, and I got a notice a couple of weeks ago that YouTube took it down. And the notice was sort of like, hey, you probably didn't know that you can't talk about this, so we're not going to put a strike against you, we're just going to take it down. Just removed it.

And these are things that I've been somewhat battling against, but for me, I'm not even battling against these entities, it's a battle of our minds to be able to stay true to our mission and to stand up and to operate in integrity, even when it seems like the world might be going crazy around you, because it's very strange that we would have a time where our country's built on the premise of freedom of speech, and we have a situation where our government is working in tandem with these regulatory agencies, with the social media platforms to sensor our freedom of speech, under the guise that it's protecting citizens from getting bad information or misinformation or disinformation and these different labels, but the problem is, who gets to decide what the misinformation is, because as we've already gone through, the real world randomized controlled trials that were published that are being used to enforce mandates, is that the actual misinformation, because the framing of this study that we just covered by again, probably well-intentioned researchers at Texas A&M, saying that if people wearing masks were saving all these lives based on our theoretical model, that could be easily, much more easily framed as misinformation, than the randomized controlled trials that I've been sharing since the very beginning. Now, another one of these low-quality studies, and this was actually highlighted by major news sites, this was used by health officials, were quoting this.

And so again, major, major news sites published this, this is one of the headlines, "Surgical mask can reduce the spread of COVID-19 by up to 75%," but if you actually examine the data, you'd find that the courageous study participants in this study were hamsters. These little fellows were the ones tasked with protecting everybody from COVID-19. Now again, when you hear that headline, when the average person sees the tweet from their health official, that mask, again "can reduce the spread of COVID-19 by up to 75%." Woohoo! Eureka! Made another affirmation. So, hamsters were injected with COVID-19 and then placed into cages in plastic boxes next to another cage of uninfected hamsters. The cages were separated by a hole because of course, we're trying to simulate real world conditions. In some parts of the study, they put a surgical mask between the holes. Other times they didn't. These were the conditions that they came up with the 75% effectiveness figure. The lead researcher in the study stated, "In our hamster experiment, it shows very clearly that if infected hamsters or humans, especially asymptomatic or symptomatic ones put on mask, they actually protect other people." This is the problem with "very clearly", because this kind of clearly is sort of like waking up in the morning, crusty eye clearly, right. This kind of clearly is sort of like, somebody walks over to you with the handful of dust and blows it in your eyes kind of clearly.

That's not really clearly. Hamsters, putting a surgical mask in a hole. How dare we, and I got this... I came across this study because a reputable health official, they posted about this, they posted on social media. Look, another study, 75% effectiveness. I was like, oh my goodness, this is great. Let's go check it out. What. Hamsters? Come on. The biggest problem with studies like this is that health officials and the media are sharing these with the general population

who aren't at all concerned about looking into the source of the data and taking a rational perspective, especially when we're inundated with so much fear. This is how we get to such an illogical place as a society, very simple. When we let studies like this influence our policies and our belief systems of our citizens, that's how we get into the place that we're in right now, where it's so debated for people to even talk about mask effectiveness. It's just like, you better know that the mask is effective or you're an anti... That's a... Not even going to say the rest. Alright.

So, let's examine one more of these studies that were pressed into society, propped up, and I saw this as a tagline when I was seeing the commercials for folks to wear masks, they were referencing this particular study, and this was published in The Lancet, and this was funded by the WHO. Now, if you're watching on the video, and we're going to highlight something very important, this study states, "Our research identified 172 observational studies across 16 countries and six continents with no randomized controlled trials, no randomized controlled trials and 44 relevant comparative studies in healthcare and non-healthcare."

You're wondering what a comparative study is this is a study essentially looking at how something is the same or different from something else, it's incredibly vague and again open to confusion and biases, as mentioned before, observational studies by their very nature are unreliable and unclear, there is no specific intervention being employed and they're not actually looking at a specific outcome. And so again, confounding factors, biases are going to be rampant in studies like that, whereas a randomized controlled trial is where we have researchers introduce a specific intervention and look and analyze a specific outcome. They have a specific intervention and analyze for a specific outcome. And it's also randomized so that helps to reduce and eliminate biases. And so, for me to even take the time to acknowledge a study like this compared to the data that we have, it's really not going to be a viable use of my time if I have randomized controlled trials to look to, but regardless, because this is such a debatable issue and there's so much... So much of a divide taking place, I did, I went and dug in, spent a tremendous amount of time going through the references, it's a lot.

Again, 172 observational studies. Wow. And I did a targeted Masterclass episode looking at this Lancet study, and you can see that at themodelhealthshow.com/maskfacts. Alright. So, not mask science, mask facts. That's where you'll see the original mask facts documentary, and also this masterclass session looking at some of the updated data and going through and breaking down this Lancet study, which again is looking at a hodgepodge, truly, once you see all these references, it is insane. It's insane that this is even given any credibility as being affirmative towards the effectiveness of masks, there's so much nonsense in this and so many things that were not about mask, it was just... It was tough, it was tough.

It was a tough pill to swallow, but I did and I went through and took the time to do it, and so again, if you want to check that out, is that themodelhealthshow.com/maskfacts, the original mask facts documentary is at the top of the page, and this analysis of the Lancet study is at the bottom plus we get in to some more viable real-world, high quality studies, like the ones that we're going through here. Now, a big deflection point, a big one of the what-about-isms is we just went through some high quality randomized controlled trials and found that over and over again, the results with interventions with mask did not show significant outcomes, the results were often not statistically significant, but the what-about-ism can be... Well, the data demonstrating mask unfortunately the not effective at reducing the spread of viruses, well, that's not against SARS-CoV-2.

That can be one of the deflection points, we don't know about COVID, that was the story very early on. But of course, scientists were asking questions and doing analysis along the way, and again, if we're just going off of history and the data that we do know, it's probably going to be more the same. And here's what we see with a randomized controlled trial conducted the CDC, and it looked at the mask usage, in 314 symptomatic sick patients. The patients were split into two groups, the control group was 160 people who were sick but didn't have COVID-19. Then they had the case group, this was 154 people who were sick and had COVID-19. After analyzing the mask usage of the patients, they found that over 70% of the people who contracted COVID-19 where people who strictly adhered to the mask mandates, and always wore their mask. Over 70% of the people who contracted COVID-19 always wore a mask, versus the COVID patients who said they never wore a mask being just 4% of the cases. Over 70%, always wore a mask and got COVID versus 4%, saying they never wore a mask and got COVID.

In fact, if you combine the folks who said that they always wore their mask with people who said they often wore their mask, that's 85% of the people who got infected with COVID-19 versus just 8% of the cases occurring in people who said they never or rarely wore a mask. If these numbers were flipped, you would have heard this study everywhere, it would have been everywhere. But because it bore these results, most people never heard about it, unless they heard it through my platform, or some of the people who've... It just gets passed along, and the next thing you know this person is sharing the data, that person, that's the nature of the internet today, but this would be major headline news repeatedly referred to over and over again. Now again, this data in of itself should be incredibly eye-opening, but here's the thing, the study was essentially trying to uncover how people are getting COVID-19 even though they're adamantly wearing mask. So, the researchers conducting this study probably have the underlying bias that masks are effective, we just got to find out why they're not working.

And so, the researchers pinned down that it's taking the mask off to eat at restaurants that were causing higher cases of COVID in the case group versus the control group. So that's what they identified, they were trying to look at behavior patterns, they find that when you take the

mask off to eat at a restaurant specifically, that's when people are getting COVID, but here's what's missed. And again, this is just leaning into logic, again, what's missing in the study is that the control group are people who were sick too.

They got sick as well. They're not people who avoided getting sick, that's what's missing in this study. They got sick and ended up in the hospital too. Even though they didn't go out to eat at restaurants as often and take their mask off to eat. And the mask wearing behavior of the control group who again got sick with something else, another type of infection and ended up in the hospital, almost 75% of these folks reported that they strictly adhered to the mask mandates and always wore their mask. Yet they still got sick. 75%, versus just 3% of the people who said they never wore a mask getting sick. This control group didn't go out to eat as often thus didn't take their mask off as often to eat somewhere, yet they still contracted infections despite an exceptionally high rate of mask compliance. So, we do have some data on COVID-19, and that data is continuing to expand, and you would think with such a contentious hot topic and highly debated issue that our government would have put some studies in place, our regulatory agencies, our public health agencies would put some studies...

Why have we not had that? Instead, what's being passed around right now and what inspired this episode is the Bangladesh study. Alright, Bangladesh. So, we got the Bangladesh study, now circulating, and as of this recording, it's still in review and in it pre-publish state. The title of the study is "The impact of community masking on COVID-19, a cluster randomized trial in Bangladesh." In this study, households were randomized to receive messages emphasizing, this is to get them to use the mask, either altruism or self-protection. So, they were using some psychological tactics to get these households in Bangladesh to wear the mask. Now, I got to just say this right off the bat, there are so many confounding factors and biases here and possibilities for error in reporting that again, I can't believe that this is getting passed around and even taking very seriously. We're going to talk about why, but this is, it's one of the things that's getting propped up right now, and you're going to hear the reason why it's getting propped up.

Mask wearing was assessed through observational and public locations, including mosques, markets, the main entrance roads to villages and tea stalls. The researcher stated, "Surveillance staff noted whether adults were wearing any mask or face covering, whether the mask was one distributed by our project, and if so, the color, and whether the mask was worn over both the mouth and nose." So, they had staff at these various places watching out because they distributed masks to certain groups, they got a control group without masks, and they got the study group that they gave masks to and they're at these various locations trying to watch and see if people are wearing their mask or not and how they're wearing it. Again, at tea stalls, at the entrances to various roads into villages and whatnot. Now to minimize the likelihood that

village residents would perceive that their mask wearing behavior was being observed, so they don't know somebody's watching...

Let me do the right thing that I'm told to do. To minimize that likelihood, the surveillance staff were separate from masks promoters, the people who were actually promoting and giving out the masks, and they wore no identifying apparel. The surveillance staff, while passively observing the mask-wearing behavior. So, these folks are essentially spy kids, they're hiding out... They're mask spies. They're hiding out, they're not... They don't have any identification. They're hiding out in various places to see if people as they're walking into the mosque or they're entering the village from a road or at the tea stall, whatever the case might be, they're seeing who's keeping up their end of the bargain and wearing the mask. And there were some other ridiculous variables in this study as well, for instance, 60% of the people tracked with a supposed COVID-like illness, said they didn't want to be tested. "Yeah, I'm sick, but you can't test me though," and I'm saying this because in this study, they noted that more participants in the control villages reported incidents with COVID-like illnesses compared to participants in the intervention... The mask intervention villages.

But again, most people weren't tested, so again, they're kind of highlighting like, Hey, we had this intervention and it looks good, but we have this really strange variable of people saying they don't want to be tested because it's Bangladesh, even still, here's the results they found with this metaphoric gumbo of potential confounding factors, looking at interventions with surgical mask, cloth mask and a control group with no mask. The researchers stated, "We find clear evidence that surgical... " There's that word clear again. "We find clear evidence, that surgical masks lead to a relative reduction in symptomatic zero prevalence of 11.2%." Which again, this is their definition of clear evidence, and they stated. "For cloth mask, we find an imprecise zero benefit." Alright, imprecise zero. So basically, it's reaffirming what we already know, cloth masks are trash and surgical masks maybe offer a tiny bit of benefit, but again, the majority of peer-reviewed randomized controlled trials shows no significant difference.

Now, another aspect of this study that if people aren't... If they're just taking the headline that this Bangladesh study finds that surgical masks are effective in reducing the spread of COVID-19, that's the headline, that's what spurred this compilation. This resource for you is because I saw this again, this here's this trend again, a new study comes up and it's just... It's shocking how terrible these studies are, when we have all these well-done studies that are just completely ignored, and here's another thing, if you actually dig in and look at this the study. This is what took the cake for me. They tracked the benefit of surgical masks according to age groups as well, and they found that there is essentially zero benefit of surgical masks between the ages of 40 and 50, but when you're a couple of years older between the age of 50 and 60, suddenly there's a 23% reduction in infection. Huh? What? How is that possible?

There's no explanation for this in the reporting whatsoever, there's clearly confounding unreported factors here creating an unrealistic anomaly like this, because say you're 48 years old, you've got zero benefit with your surgical mask in this particular study, but then your 51st birthday hits and surprise, you suddenly have 23% reduced risk right now from wearing that same surgical mask, it's the... People are jumping out of the cake, they're jumping out of a surgical mask-shaped birthday cake and saying, surprise, now you've suddenly got 23% benefit. Again, I just want to know how this is getting propped up as viable science. At this point, where we are as humanity, what are we doing?

And if we're allowing ourselves to get caught up in this study and debating the benefits of surgical masks, we're looking at something that is not really noteworthy and propping up low quality science in favor of much higher quality science that's already available. Now, this study was making the rounds again as proof of the benefit specifically of surgical masks, but not for all age groups, versus... And that's not even being talked about, versus well-constructed studies with trackable environments and far less confounding factors and potential biases, like we've just covered but again, for the sake of comparison, let's look at another population study that was completely ignored yet again by health officials in the mainstream media, and it's likely because the outcome wasn't what they perceived it to be, it was what was not fitting into the determined narrative.

And this study was conducted with citizens in Denmark and published in the Annals of Internal Medicine, and it set out to determine whether surgical mask use outside the home reduces wearers risk for SARS-CoV-2 infection. A total of 3,030 participants were randomly assigned to the recommendation to wear a mask. And 2,994 were assigned as a control group. 4,862 completed the study, infections with SARS-CoV-2 occurred in 1.8 of the participants recommended to wear a mask and infections occurred in 2.1% of the control participants not wearing masks. The difference between the two groups was 0.3%, not 3%, not 30%, 0.3%. The scientists stated, "The difference was not statistically significant." Now there were so many things that can be debated, this is how this... A study like this gets brushed off to the side where they prop up the Bangladesh study instead, as if it's Simba, it's the golden child. Whereas a study that's more well done and actually has several subsets of things that they studied, this gets brushed off because you could say, Hey, what about source control? What about compliance? Again, it's just trying to construct a way, trying to explain away the result of this study when...

I don't have to try to explain away the results of the study we covered, it's their own language, it's the words of the researchers, but when it comes to the Bangladesh study, of course, I did add in some opinion some insights there because it's just kind of silly. Some of the things that they came to a conclusion with. But here in this study, and this is what was missed, if you don't dig in and actually look at the data, there were several additional un-planned results that were

found with these other subsets, one of which was participants who were reported to wear their mask exactly as instructed. So, these are people with high compliance, they studied this, again, people who reported wearing the mask exactly as instructed at all times, were found to contract SARS-CoV-2 infections 2% of the time, versus the control group who didn't wear a mask contracting SARS-CoV-2 infections 2.1% of the time. It's almost exactly the same. High compliance rate. These are the over-achievers. "I will always wear my mask" versus people who never wore a mask, 2% rate of infection versus 2.1% rate of infection.

So, what is that again? Not statistically significant. Another one of the post-hoc results noted by the researchers was that after analyzing a variety of different patient characteristics, "We did not find a subgroup where face masks were effective at levels of statistical significance." And the conclusion of the study. "In the community-based randomized control trial, a recommendation to wear a surgical mask when outside the home, among others, did not reduce at levels of statistical significance, the incidence of SARS-CoV-2 infections compared with no mask recommendation." The study exists, people put their time and energy into all of these studies, and for us to just ignore them.

That's one thing, but for us to acknowledge they exist number one, but more so to... Now, let's kind of rank and look at... Let's take a meta-perspective, look at all the data at once and see what does the majority of the data say, and you already know what that's pointing towards. Now let's look at one more aspect of mask safety and potential benefit and really look deeper at N95 masks, which for myself personally, I do see some potential efficacy here with our N95 masks, and we have to weigh that with the potential detrimental effects, because there's a little bit more with the fit with the effectiveness, there are some things to weigh. Just for us to weigh in the data as far as our duration of wear. Another study 2017 published in The Journal of Influenza and Other Respiratory Viruses titled The efficacy of medical masks and respirators against respiratory infection in healthcare workers, found that N95s versus fit-tested N95s versus surgical masks versus a control group where the researcher stated, "Purposefully selected as they indicated low levels of routine mask slash respiratory use during the pre-trial assessment."

Here's what they found, the rates of laboratory-confirmed viral respiratory infection, laboratory confirmed bacterial colonization and droplet-transmitted infections were lowest among the continuous N95 arm, that means they wore it the whole time, but what was most surprising for me in this study was how the targeted N95 group, and the surgical masks group continued to have higher rates of infections versus the control group. What? But what I found most interesting about this study is the dramatic increase in bacterial infections seen in the targeted N95 group and the surgical masks group versus the control group who had low rates of mask use, again, "purposefully selected as they indicated low levels of routine mask respirator use, this was the control group.

So, this isn't a no-mask-wearing control, and this is where people can start to like cherry-pick what a scientist might say, but we know that they have a much lower routine use of masks in this scenario, and we see people who were putting the N95 on and off, and people who were wearing surgical mask had significantly higher levels of bacterial infections. So, are we replacing one problem trying to defend ourselves from viruses and increasing the rate of bacterial infections? It's definitely a possibility based on the data that we have. Now, at this point, you may be wondering, where did all this mask advocacy come from in the first place? Well, it's because it's rooted deep into the standard of practice in our healthcare system, the word surgical mask indicates that it was a facial covering intended to be used in surgery, and it's a point of rationality for people, and I know it was for me that, hey, if masks aren't effective then why do doctors wear them? And what I did was, once that question came up for me, I went to investigate why do our physicians, healthcare workers...

Why is this a standard practice? Is this actually based on real-world data and surprisingly several studies, including a meta-analysis, which means it's a study of multiple studies. And this was published in the Cochrane systematic review, found that when physicians wore a mask or didn't wear a mask, talking about in surgery. "There was no statistically significant difference in infection rates between the masked and unmasked groups in any of the trials." Look, again, this is looking at multiple studies, they're not... They don't have anything to gain by sharing this, and again, this is pre-pandemic times where it's such a debatable and contentious and polarizing issue, so they can just say, "Hey look, we looked at this behavior and this is what we found, this is interesting."

Other studies, like what was published in the Journal of Hospital infections and more, have also concluded that the use of surgical masks in surgery are obsolete and unnecessary, and researchers at the Center for Infectious Disease Research and Policy summarized it by stating, "Clinical trials in the surgery theater have found no difference in wound infection rates with and without surgical masks, despite these findings it has been difficult for surgeons to give up a long-standing practice." Now you may be like, "I don't want a doctor operating on me without a mask on," and that's fine, we're talking about a personal choice, but you've also got to ask yourself, where did that conditioning come from, where that's even a thing, where a surgical masked doctor is even a thing?

And is it grounded in reality, and is it based on science, or is it based on tradition, because if it's not based on science and it is based on tradition or doing a certain thing, just because it's like what I've always done. It reminds me of the baseball player, Nomar Garciaparra, played for the Red Sox at the time, he was called Nomar Garciaparra. Alright. And he had this very specific ritual he would do before every at bat, he's tugging on his gloves, he's tugging on his wrist band, tapping his feet a certain way, he has this ritual he does, might be called a superstition,

that he's employing. Is it based on some form of grounded science? Hey, maybe to him. And so, this could be closer to parallel to a superstition, unfortunately, because it's not grounded in science, why we have the practice in the first place. Now, my issue, and in bringing this up again because I was like, they must work because this is what our doctors do, but now not only is it found to be not effective in that domain, this has been stretched out from the healthcare setting to our community at large.

Surgical masks were developed to be used in surgery, yet they've been found again, to be ineffective in their purpose of reducing rates of infections, but despite that, their role has expanded to people on the street. So, you walk into your favorite coffee shop now and it looks like you're in a hospital. So, the barista brings you your coffee and they're like... Just the look of them and in handing your coffee they're like, "I'm not a doctor, but I play one at coffee bean." This is what it all looks like for our programming, our psychology, when we set foot into a building where... I live in Los Angeles, it's... You can't go anywhere without wearing a mask, of course, there's this interesting black hole that when once you walk to your table in a restaurant, you can take the mask off, it's suddenly... It's safe there, but other than that, you can't go anywhere without a mask on and... So, when you walk into a place, it as if you've walked into Ground Zero, it's as if you walked into the emergency department or the infectious disease ward at a hospital, because everybody's wearing a surgical mask or some other type of mask.

So, I just want to point that out that this is another thing. Like Where did all this come from? Is it grounded in reality? I wish it was different. I really do, I wish it was like we just had some form of real-world research showing why this has been used in practice, and it seems logical, you don't want to be spraying out your aerosols and droplets in an open wound or something like that. I get that. It's not to say, Let's not do that. But when you look at the data, it says that, Hey, this doesn't really... It doesn't really matter. Now, I did mention that I see some efficacy within N95s, but that's not in all studies. A meta-analysis published in the Canadian Medical Association Journal that included six clinical studies and 23 surrogate exposure studies, the scientists found no significant difference between N95 respirators and surgical masks in associated risk of laboratory confirmed respiratory infection or influenza-like illness.

Now, these are all real-world examples of how effective these masks actually are, not speculating, not making gross assumptions, this is just looking at how things work in reality, now is the point where we take a simple cost-benefit analysis, we look at the potential benefit that we might glean in some instances, under some conditions for certain types of mask versus the potential detrimental effects seen in our peer-reviewed evidence, and this is highlighted by the controlled clinical study published in The Journal of antimicrobial resistance and infection control, and they wanted to find out the impact that N95 masks have on our physiology and they recruited pregnant healthcare workers to wear N95 masks while doing

just low-intensity activity, and the results of this study are really shocking, wearing the N95 mask reduced their normal volume of air displaced between inhalation and exhalation by 23%.

The volume of gas inhaled or exhaled specifically from their lungs each minute was reduced by almost 26%, their volume of overall oxygen consumption was reduced by almost 14%, and the ability to expire carbon dioxide was reduced by almost 18%. Now again, even as I'm going through this data, I'm like, this has got to be what happens over time as we're wearing it for a long time, no, this happened within 15 minutes. This happened within 15 minutes of putting on that N95 mask, they're literally inhibiting oxygen getting to the baby, and this is where the question comes from, why was this trial even done with pregnant healthcare workers and not done... Why haven't we had this study done on other folks? It's because somebody saw like, "Hey, I know that mask is covering their breathing pathways, I wonder if that's affecting their baby. Let's check this out." It's by us having the audacity to ask questions, that's science, that's what we should be doing right now more than ever. We should be questioning everything. Now, another study, this was conducted by the CDC published in the Annals of Work Exposure and Health, and it revealed that by wearing a mask, the highly thermo-sensitive nature of the human face and breathing pathways can be inhibited leading to increased anxiety, elevated stress hormones, false suffocation alarm in the central nervous system and panic attacks.

We're negating the fact that we are human beings. Our design is to breathe freely, we don't come here with clothes on, let alone our breathing pathways blocked, alright. Clothing is a socially acceptable thing, alright, so we're not just bumping into people and causing friction, but we've evolved throughout our millennia as a society, as a species, to breathe freely, having an apparatus over our face is highly abnormal, and so we're negating the fact that there is a thermo-sensitive nature of our face and our breathing pathways, the human nose for example, is designed to cool the air and to help to filter out particles and pathogens and things of that nature, but the cooling process is going to be dramatically inhibited when our face is covered. What can this lead to? We've already talked about it, a myriad of different potential issues, we can't just brush that under the table and say, you're not human, we're not human, you can put this over your breathing pathways, and it doesn't matter. That's not true. Yet another peer-reviewed study, this was published in the Journal of Anesthesia, revealed that within just 20 minutes of wearing a mask, the mean end-tidal carbon dioxide level in test subjects jumped up 13%.

The research has reported that, "The rise in End-tidal carbon dioxide is due to re-breathing of expired gas that is 'trapped' in the respirator." This is one of the things that was getting debunked by these so-called fact-checking sites, that there's this re-breathing of carbon dioxide. Did they look? Because the data is there. They also noted that, "Levels of End-tidal carbon dioxide have also been shown to significantly impair cognitive and psychomotor performance." Translation, you become a danger to yourself and others.

Another study published in the journal, Ergonomics, found that even at low work rates, wearing the mask contributed to significantly higher levels of CO2 re-breathing, with notable side effects such as fatigue, dizziness, headaches and muscular weakness. In just focusing on one of these issues, being headaches, a recent study published in the BMJ, the British Medical Journal, one of our most procedures journals, titled "Mask-associated de-novo headaches in healthcare workers during the covid 19 pandemic", de-novo being new or newly generated from this intervention. This study found that over 51% of healthcare workers experienced mask-related headaches. The majority of healthcare workers are experiencing mask-related headaches, and again, this is a symptom.

What's the underlying mechanism? What's causing this symptom, this side effect? Because that's feedback from the body that something is wrong, and we're being told, "Ignore it. A little discomfort, it's to protect others." We already looked through source control and what the data showed. That narrative isn't really accurate, and in fact, what happens when we start to damage our own physiology is, it's creating a higher susceptibility to not just this particular viral infection, but what about other infections? Bacterial infections. What about potentially acute damage? Because what we just went through, what was happening with the lungs in that study with pregnant healthcare workers, that is dangerous, that could damage their brain, could damage their lungs, could damage their heart.

We can't act like this stuff is not happening. Another report published by the CDC, titled, The physiological burden of prolonged PPE use on healthcare workers, details how N-95 masks can cause headaches, increase pressure inside the skull. That sounds terrible. That just sounds terrible. Why would they even say that? Reduced cognition, widespread activation of the sympathetic nervous system, increased anxiety, dysfunction of the cardiovascular system. These effects are well noted in so many studies, it's overwhelming, yet this data continues to be ignored or suppressed as if it doesn't exist.

What concerns me the most about this is the fact that instead of acknowledging the ineffectiveness of this and what's transpired in our culture, look, here we are almost two years later, we're still doing the same behavior, and we keep seeing these ways, we've got all the different variants and we're not really looking at how can we actually get our citizens healthier, more resilient against infections, because primarily, the folks that are being most impacted, as we know, we talked about this many times on the show, is folks with underlying, pre-existing conditions, and we are the most chronically diseased nation here in the United States, in the history of humanity. And we're not doing anything about it. As a matter of fact, the mandates... Our treatment of this has made our society far sicker than it's ever been, like that. The rates of childhood obesity have skyrocketed. The report as of this recording, just came out, that is just devastating. What's happening to our children? And let alone the rest of us.

Now, instead of acknowledging that, we're just like, "Well, we'll just wear two masks." We got data on the two-mask thing. It doesn't look good, and the two-mask thing is supposedly trying to create a de facto N-95. We know that... What is that N-95, the side effects are even riskier than with surgical masks, cloth mask alone. So, what do we take away from all this data that we've covered today? Well, humans are strikingly biased around this masking issue. That's one thing for certain. If they want to support their point, they'll extol the worst possible data imaginable, to do it. And if they're not willing to change their perspective, they won't accept the very best data imaginable. The important takeaway is, this intervention, based on the results of what we've seen as a society, has given people a false sense of security. Instead of forcing you to stay home, just put this mask on and you can go to work, you can go to school, you can go to sporting events, you can go on flights, you can go to concerts, you can live your life. Just put this thing on your face.

It's created a really warped version of reality that, all I need to do is wear this mask, and I get to do all these things. Just put this one thing on our face and it unlocks all these opportunities. It's a false sense of security, based on the data, and also based on the results that's taken place in our society. And this isn't even to mention all the psychological ramifications that again, goes against our very human design. And the social brain, the newly discovered social human brain, especially for our children, that's required for the development of the social brain, the emotional intelligence, being able to interact with humans, to understand expressions, to connect, and these things are also being infringed upon.

And again, if it was based on logic and efficacy, I'd be the biggest proponent of it. And so, by providing this all sense of security for citizens, you can live your life as usual, just put this mask on, it's caused us to avoid the real issue, it's caused us to ignore the most important thing for us to do, which is to get our citizens healthier, to get our families healthier, our communities that are flooded with disease, that are flooded with conditions, that encourage and cultivate disease every single day, we're not doing anything about those issues. You know why? Because there's so much money being made by farming sick citizens. These industries that are telling us what to do, that are offering up advice about these things, like wearing masks, if we're honest about these organizations, they're being propagated by a healthcare industry, and a pharmaceutical industry that exists only if we are in a diseased state. If we dramatically decrease the amount of sickness in our culture, the 250 million of our citizens here in the United States, nearly 250 million of our citizens who are overweight or obese, the 60% of our citizens that have some degree of heart disease right now, the 130 million of our citizens who have diabetes or pre-diabetes right now, if we dramatic...

If we slash those numbers by 20%, by 40%, by half, those industries fail, they fail. They require disease in order to sustain themselves. Why on earth would they suddenly focus on getting us

healthier when they've never done it before? Why would they do that? Instead, they create these overnight health advocates that are saying, "I'm wearing my mask, I'm keeping other people safe. I'm wearing my mask; I'm keeping others healthy. I'm wearing my mask; I'm doing a healthy thing. I'm getting this new pharmaceutical intervention; I'm doing something healthy. I'm healthy." And it's superficial. These interventions are not getting at the root cause of why we're in the situation that we're in right now. 95% of the folks who've lost their lives in association with COVID-19, on their death certificate, according to the CDC, have an average of four pre-existing chronic diseases or comorbidities?

95%. It's not reversed, but that's the framing, is that it's everybody. This condition is indiscriminate, but that's just not true, based on the data. This isn't to say that this isn't a virulent issue that can affect anybody and everybody, but we know that this is exposing our chronic levels of disease in our culture today. And so, this intervention is literally masking the symptoms. It's literally masking our most pressing issue as a species, and I'm standing for change. Enough is enough. What encouraged this was... Of course, the Bangladesh study hit my desk, but also it was the first time I jumped on a plane. I just wanted to... I didn't want to deal with the nonsense. Knowing this evidence, knowing all this peer-reviewed evidence that I know, but I went to an event in Atlanta and to do some work and... So, I got to see it first-hand. I get on the plane, you got to have a mask on at all times. In the airport, I could see the old social distancing, places on the ground. But that's kind of dissolved. With the basis of that, I said very early, it was just an arbitrary number. It had no basis in science. None. Just made-up.

It's a totally made-up number. But to get on to the plane and to sit shoulder to shoulder with people, and to see when the food is passed around, the beverages are passed around and everybody taking their mask off suddenly, that COVID no longer is an issue in that moment, and then to hear over the speaker repeatedly, again and again, "Keep your mask on, keep your mask on, keep your mask over your nose, you got to... We're doing this to protect other people. Don't be selfish." So, this practice is to protect everybody, but suddenly, over this four-hour flight that I'm on, the masks come off as if COVID is no longer an issue because you got some Cheezits to snack on. Just to watch this is... And I know you've probably experienced some of these things too. It's just like, it doesn't make sense. Once you get to a restaurant, you see the sign outside the door, and also the person at the door, the host, "Do you have your mask, you have your mask. Have your mask on, so we could walk you five feet, and then you could take your mask off when you sit down."

What are we doing? That is so illogical, but the reason that we're doing this right now is because we've allowed it to happen. And these restaurants are not trying to be bad guys, they're not trying to harass people or whatever the case might be. They're trying to keep their doors open. So, they're just complying to what they're supposed to do, they're just trying to run their business, even though it's all incredibly illogical and it's really silly. And what the hell

are we doing? We just devolved to being some silly species, just dancing around illogically, putting stuff on our face in order to participate in society? I really believe there we're better than this and I wanted to create a real resource that has all the studies for you, to look into where do we find some efficacy, where do we find the ineffectiveness, based on the data, not assumptions, but real world data. And also, what are some of the side effects and ramifications of this newly invented action that we're all participating in and allowing as a society?

And also most importantly, I want you to think about the impact that it's having on our children. Now, this has become so divisive. You have this new term of anti-masker, and it's just an incredibly dismissive term. It's just putting people in this tinfoil hat category, and while it's propagated that what's being done is based on science, you hear this repeatedly, "it clearly shows, it clearly shows," when it's anything but clear. So again, use this as a resource, share with your family, friends, co-workers, your local health officials, physicians, get the information out there. Or you can use the studies themselves, you can use this as a resource. Again, go to themodelhealthshow.com/maskscience, to see the video version of this episode, and of course, you can see the original mask facts documentary at themodelhealthshow.com/maskfacts.

The Model Health Show would not be possible in this format without the support of our incredible show sponsors, and this is pointing to, again, what are we doing, to actually get our citizens healthier through our nutrition, through intelligent interaction with movement and our sleep practices and things of the like? But what does the data actually show? And I only work with sponsors who I truly believe in, that I use myself on a regular basis. And one of the things that I use literally before recording this episode is my electrolytes. And electrolytes are also one of the most essential and simple nutritive factors in defending the body against infectious diseases. Very simple principle, because all of our cells, this sodium potassium pump enables our mitochondria to work, enables our cells to do all the stuff that they do. It's truly, truly based on the activity of electrolytes.

A meta-analysis published in the Annals of Clinical Biochemistry, titled, Electrolyte imbalances in patients with severe Coronavirus disease, COVID-19, analyzed five studies with nearly 1500 patients with COVID-19, and found that both sodium and potassium were significantly lower in patients with severe COVID-19. Getting our electrolyte fortified, including in these clinical trials, is one of the most overlooked, not talked about aspects of getting people well. Why do the electrolytes matter here? They're getting really pulled from the system, for the body's inflammatory response, the immune response. We need to get those resources back into our system, the intelligent way. And also, a fascinating new study published in the journal, Neuron, found that magnesium is able to restore critical brain plasticity and improve cognitive function. Combine these together, sodium potassium, magnesium, in the right ratios, that's what you get with LMNT.

That's L-M-N-T. Go to drinklmnt.com/model, and you get to try LMNT for free. Just pay a little bit in shipping and they're going to send this incredible electrolyte to your front door, for you to test out. It is truly in a league of its own, providing protection and support for our immune system and also our cognitive function as well. Again, go to drinklmnt.com/model, and also, this time of year, we're leaning into cold and flu season as this is getting recorded, you've got to know at this point, that some of the most popular conventional cough medicines are absolutely loaded with toxic chemicals.

One of the most popular conventional cough medicines have things that are actually outlawed in other countries. So, we've got these food dyes, we've got FD&C blue number one, FD&C red number 40, high fructose corn syrup, propylene glycol, saccharin. The list goes on and on. It's pretty terrible. It's pretty terrible. What can we do instead? And I highly encourage you to get this in your cabinet right now, for yourself and your kids, should you need it. A randomized double-blind placebo-controlled study revealed that honey was able to outperform a placebo and significantly reduce cough frequency and severity at night and improved sleep quality.

Now, it's not just honey. Let me give you an added bonus here, My family uses Beekeepers Naturals B.Soothed cough syrup. It's naturally powered by nature's most powerful immune supporters, pure honey, pure organic honey, elderberry, chaga mushroom, bee propolis and olive leaf extract. Why is this formula so powerful? Well, a double-blind placebo-controlled study published in the peer review journal, Advances in Traditional Medicine, found that after 48 hours of treatment with elderberry, coughing was relieved in 31% of patients versus the placebo. The study also noted significantly reduced fever, headache, muscle aches and nasal congestion within 24 hours of treatment with elderberry.

B.Soothed contains no drugs, dyes, toxic chemicals, refined sugars. Highly, highly recommend checking it out. Go to beekeepersnaturals.com/model. That's B-E-E-K-E-E-P-E-R-Snaturals, with an 's', beekeepersnaturals.com/model. And now, listen to this, we've gone from a 15% discount, they're giving right now, a special 25% discount, and it's more needed than ever right now. So, pop over there, check them out, beekeepersnaturals.com. I can't say enough about the propolis as well. A peer review study published in the journal, Antiviral Chemistry in Chemotherapy, revealed that propolis has significant antiviral effects, specifically in reducing viral lung infections. There's propolis in the B.Soothed cough syrup, there's also an incredible propolis spray that they have, as well.

Check them out, beekeepersnaturals.com/model. I want to thank you so much for devoting your time with me and getting educated on this subject matter. It's of the utmost importance because it's one of those things that's really being propagated as a distraction, it getting people fighting, being divisive. And is it even logical? That's the thing. We're fighting over

illogical things and we're not getting to the root cause. We're not supporting each other; we're not loving each other. We're not extending compassion. And these things that we've been implementing, have been literally pulling the strings, pulling at the fabric of our families, and really devolving our humanity. Right now, we need more humanity, we need more love, we need more compassion, we need more understanding, but we also need more speaking up and standing up for what's true and sustainable, truly for the greater good of all of us. And so, regardless of what's happening with our friends and family and their beliefs, how can we still extend ourselves in a way, to add some value to their lives, to support them with their exercise routine, or something healthy with their food, or making sure that they're getting adequate rest or doing something to reduce their stress. Let's do things to bring us together, to unify us so that we can have these conversations.

And that's what's most important right now. So, I appreciate you so much for tuning into the show today. Please make sure to share this. Share this adamantly, with the people that you care about. We've got some incredible episodes coming your way very soon, so make sure to stay tuned. Take care. Have an amazing day. And we'll talk with you soon. And for more after the show, make sure to head over to themodelhealthshow.com. That's where you can find all of the show notes, you could find transcriptions, videos for each episode, and if you got a comment, you can leave me a comment there as well. And please make sure to head over to iTunes and leave us a rating, to let everybody know that the show is awesome, and I appreciate that so much. And take care. I promise to keep giving you more powerful, empowering, great content to help you transform your life. Thanks for tuning in.