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Epsiode name: 'Fatness and the Body' Episode 5: When the measure becomes the metric: making sense of the body mass index in research and practice

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Transcript

It's my sincere pleasure to have the opportunity to present, and of course, thanks to Stanley and Zofia for organizing. So the goal of my talk is to provide a critical overview, if you will, of how body size is used in research and discourse on health, synthesizing theory from anthropology, sociology, public health and the numerous other domains in which body size and health is of interest. And when I say body size, I am primarily referring to the to body waist, body weight, based measures like the body mass index which is the primary outcome or predictor in a lot of research that we see. But I think a lot of the points that I'm going to make are applicable to this kind of broader notion of body size, regardless of how someone chooses to operationalize it. So as Zofia mentioned, my background is in sociology but also demography. But I consider myself an interdisciplinary health researcher who firmly believes that it's very hard to improve the health of individuals and populations without taking in perspectives and ideas across different disciplines and schools of thought. As I try to do in this talk, and as I believe is very central to UBVO's objective, I also believe it's very important to acknowledge health as a normative construct, and that social researchers' perspectives on health and this measurement are just as valuable as that of health scientists and practitioners. Thus, I imagine some of what I discuss may not be entirely novel, and there may be even as something some elements of kind of preaching to the choir. In terms of not really having to convince you of some of these things, but I hope that the connections they make across literatures and the bigger argument they are in service of proves valuable and enlightening. Most importantly, please think of this talk as a kind of discourse. I hope that some of the more abstract and conceptual issues that I discuss are helpful in how you think about body size and health. But I'm of course very interested to hear your thoughts on how these ideas do or do not

work in practice when it comes to your specific disciplinary grounding and the goals of your research.

One issue that I want to be very clear about in my kind of critique of the body mass index, if you will, is that I actually think it is perfectly appropriate and often entirely necessary to measure body size or more broadly, to derive some kind of quantifiable metrics and standards related to body size and health. Rather, I identify the focal issue as a matter of how much certainty or finality we assign to these measures, and in turn, how these measures can become blinders that lead us to narrow and inaccurate decisions about individuals. So some of you may be familiar with the quote I have on the screen. “When a measure becomes a target, it ceases to be a good measure”. It's a very parsimonious summary of my focal concern about the ontological roots of the BMI and how it is used in contemporary science and society. As is often the case with a very good and catchy quote, the original version of it is far less elegant. So the above version of Goodharts’ Law was coined by anthropologist Marilyn Strathern, while Charles Goodharts’ concern was more about monetary policy. Per the notion that any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes. So that doesn't really go off the tongue quite as well, but I think it's just as applicable to efforts to measure body size and if anything, it effectively conveys the interrelationship between body size, health and control in our society.

So beyond the inherent relevance of Goodharts’ Law to the measurement of body size and the challenge of measuring and standardizing health more broadly, I really appreciate its inherent neutrality towards measurement and statistics. Namely, when you kind of think deeply about these quotes or you know, Goodharts’ Law, the measure itself is not an issue, but is instead its application, which is a nuance that I think is often lost, especially when people start kind of going down this road, you know, post-modernist notions of science and knowledge and measurement. And you know, admittedly, sometimes these things are taken to the extremes and become caricatures of themselves. So if there's one idea that I want you to take away from this talk, it's not that BMI is bad or helplessly flawed as a measure. Rather, it is kind of corrupted, if you will, by its failure to live up to the impossible demands that we have of this measure, at least when it comes to certainty about health. So hopefully I can at least partially convince you of this by highlighting the multiple dimensions of health and well-being for which we use BMI as a proxy for. And rather than despair and abandon BMI, I contend that by relaxing some of these demands and allowing for greater uncertainty in the use of this measure, we can continue to use it, albeit more responsibly and conscientiously.

So with these disclaimers out of the way, if you will, I want to start with the quite basic but surprisingly complex question of why we care so much about the body, as this underlies our fixation with its measurement and quantification. So health is of course, a very obvious candidate, as time and time again, we find a very robust associations between measures of body size and a host of different health outcomes, and while I'm critical of some of this research, I don't for a second think that this line of inquiry is unnecessary or wrong. I just question if we know as much as we think we do about the complex nature of this relationship, and express concern over what happens when we promote a singular narrative relationship. Indeed, even in recent years, amid the concern about obesity and COVID, the complex nature of how and why body weight is associated with poor health has been paramount. Well, we know that adults with overweight or obesity, obesity at higher risk, we cannot be confident as to how much of this is a function of biological versus more social mechanisms and more importantly, COVID is just one of many, many health outcomes where the nature of this association with body size and BMI cannot be reduced to a simple explanation. As this uncertainty is a recurring theme in research on body size and health. But health is not the only reason we care about the body. We increasingly perceive the body through the lens of morality and what it means to be a so-called good person in contemporary society. This is inextricably tied to our perceptions of who is and is not a healthy person and thus a contributing member of society, or so-called, you know, good citizen. And I'm going to talk about the idea of bio citizenship later on, but the core premise is that having an abnormal or unhealthy body is strongly tied to contemporary ideals of morality and goodness.

In the American context, and I do apologize that you know in advance that some of my talk is a little US-centric focus. A relevant concern might be individuals ability to serve their country as seen in this public health messaging on the adverse national security implications of the obesity epidemic. And of course, we cannot talk about morality and goodness without invoking the idea of normality and the desire to be normal in a society where deviance is often penalized. And this is a particularly interesting subject when it comes to body size, as technically speaking, the majority of the population would be considered unhealthy. And thus abnormal, based on the medical categories we use to describe individuals weight. But of course normality is defined by social norms and expectations about the body and health rather than the actual variation in body size that we observe in the real world. In turn, these social norms push people to avoid stigmatizing labels of abnormality or unhealthiness often by adopting harmful beliefs and behaviors about themselves and others, but also by lying about their height or, well, height or weight in the pursuit of a more socially desirable label, as may or may not have been the case for a certain former US president. So perhaps more importantly, the expectations we have

about health, morality, and normality are all inextricably intertwined. I find that studies on beliefs and values that formerly or currently obese individuals have about body weight and size help illustrate this morass of both conflicting and reinforcing ideals. For instance in one study, the overwhelming majority of respondents would rather be blind or have some other significant handicap than return to having obesity and not a single respondent would take being a millionaire over having obesity. Similarly, a very large proportion of adults with obesity are willing to risk death to pursue weight loss or reach a specific weight, ironically, or perhaps tragically, exceeding the percent who state that their goal is perfect health.

Critically, the reasons that individuals provide for having these fairly extreme preferences are not solely a function of the physical limitations associated with obesity, social stigma, or the extent to which individuals are othered as a function of obesity as social status, is often just as strong, if not a stronger influence on how and why many individuals would rather live shorter lives than have obesity. So having this kind of social or societal context for why we care about body size and the body sets the stage for the main focus of my talk, which is the aforementioned overview of the many and diverse ways body size, largely based on BMI, is framed as a measure of health. And as I mentioned at the onset of the talk, BMI as a measure is value neutral. You know, it's just a mathematical entity represented by kilograms over meters squared. That's all it is at its. Any and all connotations related to health and well-being come from those using BMI and body size in one form or another. So a critical understanding of this use and misuse is very important.

As I try to show in this figure, I contend that the majority of applications categorize body size as a proxy for individuals health related behaviors and lifestyles, or further up along the health continuum, as an outright biomarker of poor health, further escalating assumptions about its harmfulness. It's just used to demarcate the presence of disease in and of itself. And we're going to start by focusing on the behavioral or lifestyle perspective. One of, if not the, central tenets of contemporary public health is identifying and intervening on behavioral risk factors. And without passing any judgment on that motivation, this disciplinary ideology is driven by the fact that we do live in a world where there are many threats to our health and that better knowledge of these risks is essential. And I think this is a good perspective to have and I think we would be remiss to ignore it, it's a good perspective to have, but I think we need to consider the ways in which this promotes a very specific way of thinking about risk in a society and what should be done to mitigate it. Namely, this is a very strongly positivistic and statistical perspective whereby individuals come to be defined by specific risk factors and behaviors that are the targets of intervention and control. Public health messaging often emphasizes the risks posed by specific health behaviors and their associated cause. And, of course, obesity is ubiquitous in this risk factor narrative, often conceptualized as a summary of a core set of negative

health behaviors on par with smoking or drinking or drug use, in other words, obesity is framed as something a person does to increase both individual and population risk.

So much of this risk factor ideology is rooted in the emergence of the surveillance medicine framework over recent decades. By making health measurable and trackable, we try to mitigate the uncertainty that we have about the many health threats in the world. And again, this is entirely logical. This makes sense because a lot of the leading causes of morbidity and mortality are indeed defined by the things we do, rather than the things that we are, say, exposed to. In turn, many of the health threats that we encounter are dubbed man-made or human made epidemics. As is often the term used to describe obesity, and as is reflected in the kinds of imagery and statistics that are used to emphasize the spread of obesity across time and space. But what are the consequences of thinking about health in this language of surveillance and control, especially when we're framing body size as a proxy for individuals lifestyle? Public health interventions are often predicated on the widespread adoption of healthy lifestyles. These healthy lifestyles and behaviors are paradigmatic of good bio-citizenship, where individuals adhere to a set of health norms and expectations that are commensurate with their value as contributing members of society. We associate health behaviors with ideals for self-control, tying one's body and how that body reflects one's lifestyle to morality and social value. Simply put, people who are considered good bio-citizens act and thus look a certain way and are in turn perceived as more valuable than those who do not. There's a strong social and moral equivalence between acting the right way and feeling and looking the right way.

I thought this vintage weight loss ad really helps convey this message. Indeed, any kind of deviation from the socially agreed notion of right represents a flawed identity that is not only damaging oneself, but is also implicated in broader social feelings. It gives rise to this pervasive social belief that when we as individuals make bad decisions about our behaviors and lifestyles, we create negative externalities that hurt everyone, which only then reinforces this narrative about bodies, behaviors, and bio-citizenship. Most importantly, if we truly believe body size is a summary measure of specific health behaviors, then it seems like the best course of action would be to focus on and target these underlying factors rather than making body size the scapegoat for poor health and the sole metric for progress. Evidence suggests that taking diet and physical activity into account explains much of the poor health we associate with body size and obesity. If anything, the focus on weight loss is counterproductive to the mission of promoting good health, prioritizing weight loss above all else is commonly associated with disordered eating, the uptake of harmful behaviors, and general declines in overall physical and mental health. Critically, the focus on weight as a risk factor impedes our ability to think beyond weight loss as the sole criteria by which to judge the success of behavioral

interventions. And to draw on some of my own work in interviews that I've done with clinicians, it's very interesting to observe how they explicitly try to avoid a focus on weight as a measure of success. Yet the patients and families they work with are so conditioned to think about their health by what it says on the scale, and it's incredibly difficult to promote this more holistic approach to maintaining a healthy lifestyle.

And even if patients and families are making progress in other domains of their health and well-being, maybe you know they're reducing their soda consumption, they're playing more sports and they're just generally feeling better about their bodies, the personal evaluations of success and failure, unfortunately, still hinge on BMI and weight. So while the risk factor framing for BMI has its limitations, a conceptual advantage is that it's at least acknowledges that body size reflects the possibility of future harm. Introducing, you know, some ambiguity in its status as a measure of health.

By contrast, the biomarker framework implies one's health is already impaired when exceeding the limits of what is considered a healthy body size, or BMI. This is in large part attributable to how we have come to think about and define objective evidence in research over the course of the 20th century. Advances in the technology and science of measurement and the consolidation of knowledge about health and medicine has pushed clinicians and researchers to demand transparent, objective and irrefutable information about the body.

And in theory, this makes complete sense as we want to eliminate as much guesswork as possible in assessing individuals health. But in practice this requires and thus prioritizes measures that are quantifiable, standardized, and unambiguous, or at least perceived as much. Given that even the best measures provide far less certainty than I think we would like, historically, body size was viewed through a more qualitative and holistic lens, to the extent that it wasn't thought to provide much direct evidence about a person's health. But this approach doesn't work particularly well in the modern world, where all evidence is not held in the same regard. This is precisely why BMI, despite its many limitations, is so widespread and seemingly unavoidable because it fits this evidentiary framework so well. This is also why, in my opinion, calls to abandon the BMI are disingenuous and frankly, a bit naive in their ignorance of how clinical evidence is used and talked about. BMI is valued because it has the kinds of properties that a good measure of health should have, rather than necessarily being a good measure of health in and of itself. To put it more bluntly, measures like BMI are perfectly suited for our modern approach to health, data collection and analysis. As one of the most consistently available pieces of medical information for health records and insurance documents. So Cigna, which is a large health insurance company in the United States, and I know that that's a bit of a foreign concept. Bear with

me. Has a knowledge, has a Know Your Health Numbers campaign, which situates BMI among blood pressure, cholesterol and blood sugar and its association with health expenditures and other concerns. These kinds of campaigns are targeted at lay audiences, reinforcing the framing of body size as a sign of poor health, to the extent that awareness is critical to save one's life.

We also need to recognize that beyond the continuous operationalization of BMI and other measures of body size, the widespread use of categories or cut offs to describe some kind of objective state of health involves a lot of subjective decision making. Categories are finicky and often arbitrary, as their supposed objectivity is a function of subjective choices intended to serve specific purposes. Generally, we sort individuals into reductive binaries of healthy or unhealthy based on their body size, regardless of how they fare otherwise, largely in an effort to reduce ambiguity and give meaning to otherwise arbitrary health metrics. Indeed, this issue of diagnostic labels is something I will return to later. But objectivity is very slippery and that it means different things in different times or situations. Even if we purport to describe the same underlying reality or truth of individuals health, our understanding of health is often a reflection of changing norms about what constitutes objective evidence about health rather than actual changes in the objective reality of health. And to illustrate this point, consider the changing criteria for healthy body size. Over past decades, millions of US adults were suddenly reclassified as unhealthy based on shifting standards and criteria about what constitutes a normal weight, and millions more continue to be on either side of these boundaries, ostensibly separated from healthiness by just a few BMI points. I was just going to ask the question of what you think what percent of US adults you think are within two points of being considered obese. And you know, I don't know if this is a surprise or not, but it's just over 1/5 of adults who are in this liminal space fluctuating between kind of healthiness and unhealthiness at any given point in time. And I don't have the numbers for the UK or other countries, but I would guess that the situation is quite similar given fairly similar BMI distributions across most Western populations. So the point is that these narrow constraints on how we define health have significant implications, as relatively minor tweaks to guidelines have substantial repercussions for how physicians, insurers, and the public at large understand health. Moreover, these categories assume a level of homogeneity in relation to health that is really not substantiated.

Standards are of course, required for uniformity in health research and practice, but they come at the expense of nuance in understanding the full spectrum of health among those grouped together based on weight. Consequently, there has been a call from the medical community to avoid conflating cardiometabolic health and body size, recognizing that many adults with obesity are not necessarily physically unhealthy. You know,

cardiometabolic risk is a very complex construct. It has a ton of inputs and then there are a lot of different combinations of these inputs that vary substantially across individuals. So a single measure like body size is maybe not very medically meaning. In the United States, it's been very encouraging to see some real momentum on recognizing the limitations of BMI as a biomarker and as a direct measure of health. But we would probably need a more fundamental and seemingly epistemological referendum in our orientation towards clinical evidence to convince the many, many stakeholders invested in this relationship between weight and health that they can no longer use this very convenient and simple measure.

I actually saw an article just this morning providing a very thoughtful commentary on the very long road ahead of us in trying to, you know, phase out BMI, given how central it is to the massive medical industrial enterprise, underlying overweight and obesity and their treatment. That's not to say that these efforts are in vain to, you know, try to add a little more nuance to the measurement acknowledgement of these limitations and a desire to downplay the emphasis on unit dimensional measures like BMI informs the central goals of something like the Health at Every Size Movement. This strives to promote good health rather than healthy weight, especially when a focus on attaining the latter can itself lead to poor health. Weight targeted interventions are often unfortunately ineffective and unsustainable.

Emphasizing dietary and exercise regimes where the only metric of success is weight loss, which decades of research proved to be unfeasible for a large proportion of individuals. Many adults successfully improve other cardiometabolic indicators that allow for better overall health and longevity. Indeed, the discordance that many individuals feel of having an unhealthy body weight despite otherwise having healthy clinical indicators is an entirely avoidable source of doubt and dissatisfaction in clinical encounters, as well as individuals perceptions of their health and well-being.

And I'm definitely not suggesting that individuals should be the sole arbiters of their health. Otherwise, you know, why would we need doctors or medicine at all? So clearly I'm not arguing that. But I think that anyone thinking critically about individual and population health should be cognizant of issues of autonomy and self worth, when it comes to personal health and well-being, and how often these issues are ignored or sidelined in our social deference to the more top down hierarchy of medical biomedical known. Moreover, in a society where body size is the target of so much stigmatization and bias, a focus on weight can be blinding during medical encounters, leading to skewed and incomplete assessments of individuals' health, which only then become magnified at the population level.

So while the treatment of body size, or BMI, as a marker of health, retains the possibility that one is on a pathway to poor health, as is implied in the framing of BMI as a screening tool, which is actually a very important topic in its own right. And I just kind of left out of this talk. But I'm happy to discuss if anyone has questions. The use of obesity as a diagnostic label for disease assumes a much higher degree of certainty about individuals' health, but also brings about its own set of unique issues. So disease is central to the biomedical model as we have historically reified a standard of health by which healthiness is defined as the absence of disease, thus ingraining the notion that health is a binary construct. In this system, diagnoses serve a very important function, and that they codify these binaries and in turn allow for these nice clean boundaries in our definitions of health that is describing obesity as disease, mitigates uncertainty in how much significance health professionals, researchers, and laypersons should then accord to measures of weight. And in this way, it has a very strong impact on how we view body size as a reflection of individuals' overall health. And again, I want to be clear that all these health constructs, whether health behaviors, biomarkers or diagnosis and disease, serve a purpose and are not inherently designed to cause harm.

As per the title of the slide, diseases are nosological necessity. That is, we need to assign a name to various conditions as disease labels make them legitimate in the eyes of medicine and healthcare. The disease label often reflects a very well-intentioned desire to reframe obesity in a way that provides avenues of treatment that might otherwise be closed off. If and when obesity is seen exclusively as a function of individual choices, the label is also a bureaucratic and emotional necessity, promoting rapid growth of pharmacological interventions, increased availability of surgical procedures, sanction obesity treatment as an available transaction, and importantly helping patients who need this label to get the desired clinical guidance and intervention.

Many medical organizations like the American Medical Association have explicitly adopted the practice of formally labeling obesity as a disease to legitimate obesity as a diagnosable health condition. However, calling obesity a disease has encountered pushback among those contending that the label is unjustified, inaccurate and harmful in its perpetuation of weight related stigmatization. So while we illogically define obesity as a disease based on a person's body size, in many cases we cannot actually know if their body size is causing poor health. Many argue that this conflation of measurement with disease puts us on a very dangerous and slippery diagnostic slope, where other risk factors like being male, being over age 40, riding a motorcycle without a helmet, not sleeping 6 to 8 hours a day, should also technically be called diseases. The inability to scientifically prove either that obesity is a disease or that it is not a disease has led medical organizations to adopt a more utilitarian position, asking whether obesity should be called a disease rather than

whether it is a disease in the name of a greater social good. And I put this in here and I know it's impossible to read, but it's just a table from the American Medical Association's statement on declaring obesity as a disease that highlights the considerable debate that this decision has spurred, complete with this list of pros and cons highlighting the extent to which medical diagnosis becomes more of an art and maybe a little bit less of a science when the diagnostic tools and measures fail to provide the desired level of clinical certainty, as is the case with BMI and body weight.

And it's important to remember that diagnoses are consequential in and of themselves, and that diseases fundamentally redefine individuals' health marking a transition from disease, free and healthy to diseased and unhealthy. The label of obese, and increasingly, overweight is very powerful. It can produce an instantaneous and traumatic change in individual sense of self and perceptions of their overall health. Though the disease label is used to legitimize obesity as a health issue and remove personal blame, this decision cannot be disentangled from the social and moral consequences of labeling individuals with obesity as diseased and unhealthy, in a society where we continue to blame people for their health problems. And I give all due credit to the field of obesity medicine in recognizing the importance of reducing stigma. Their use of the disease label is intended to shift public perceptions of obesity away from the misinformed view that obesity is a lifestyle choice or aberrant behavior, and toward a framing of individuals' body size as a product of external social and biological forces. Yet a substantial proportion of the population, policymakers, the media, upholds an obesity narrative premised on personal failure and public perceptions of responsibility, strongly linked to pre-existing beliefs about individuals as the cause of poor health.

So this speaks to the bigger issue of whether it is right to medicalize body size in the first place, or place it under the purview of medicine as is afforded by the measurement and standardization of body size and BMI within and outside of clinical settings. As Susan Greenhalgh noted, who I know you had the pleasure of hearing from earlier in this semester, there is a certain unfairness to medicalizing body size, as it is unjust to classify 1/3 of children and teens, to say nothing of 2/3 of adults as biologically abnormal and diseased, when the field of medicine has no safe, reliable means to enable them to lose the weight and keep it off, and so become well and normal. Likewise, most people are heavy in good part because of forces that lie beyond their own and medicines' graphs, calling into question the utility of measures and diagnosis that seem to create more problems than results.

This form of reckless medicalization is reflected in some of the public health messaging that is used in anti-obesity campaigns, and this is a rather infamous example from a US

childhood obesity campaign, which, as is true of many campaigns, is well-intentioned. In attempting to combat, you know, a legitimate health risk in the form of childhood obesity. But as is often the case, it runs the risk of doing more harm than good and reinforcing a narrative of unhealthiness, abnormality and immorality, that not only applies to children, but their parents as well.

So I know that I've spent basically the entirety of the talk discussing all the different ways that measures of body size like BMI are premised on a faulty assumption that leads to faulty, if not outright harmful, conclusions. So one might logically assume that I would in turn advocate for avoiding measures like BMI if and when possible. And indeed that's often how you hear people talk about BMI, asking researchers and practitioners to ignore it entirely that, you know, the article I mentioned that I just came across this morning, it already kind of captures that sentiment in the title. And I already kind of prefaced the fact that I think that this is entirely impractical and honestly unrealistic. I would even go so far as to say that it is inappropriate and even a little bit unethical, to entirely ignore BMI or body size in this way. That is, we cannot and should not ignore that some kind of relationship exists between body size and health, and that there are valid reasons for invoking different frameworks to help organize theories and evidence as to how that relationship unfolds. As I have reviewed in this talk, rather, my goal was to illustrate that these frameworks are not neutral and prove consequential for people with so-called abnormal bodies. In turn, measures of body size become imbued with all sorts of meanings and assumptions that undermine their neutrality as measures above all else, and that's how the measure becomes a metric as a function of these different expectations. But that does not have to be the case.

So in light of these concerns, I wanted to close by discussing how we can continue to use body size to further our understanding of health, but in a more responsible and conscientious way. Namely, I argue that body size should be reconsidered as solely a measure of health and instead recognized as a human trait related to health through a diverse set of mechanisms. Many of these are psychosocial rather than biophysiological, which I will elaborate on. The pervasive medical or clinical framing of body size and its measurement perpetuates belief beliefs about normal weight beliefs about a normal weight that represents a health. Instead, we need to consider the advantages of acknowledging body size as a relatively neutral form of human variation, free of health related biases and assumptions about how a person eats, the extent to which they exercise, or their risk of disease. Critically, this does not prevent anyone from continuing to measure body size via BMI or any other measure, but instead encourages a more open minded orientation towards what this measure is and what we think it is doing in a given conceptual or empirical model. Personally, I think of this weight neutral approach as akin

to conceptualizing body size as yet another axis of inequality that many individuals encounter on a daily basis and which is detrimental to their quality of life. Though I do have to acknowledge that as a sociologist I'm predisposed to viewing most issues through this inequality lens, so here I just show some data from the Adolescent Health Study, which is a US study following adolescents into adulthood tracking all sorts of measures, including their health along the way, and here a question is asked in adulthood about the primary reasons that adults encounter discriminatory treatment in their day-to-day lives. So we see a lot of the key social determinants that we study in health research like race, sex, socioeconomic status.

But what about physical appearance and weight? Clearly they are a very important source of inequality and poor treatment in contemporary society. Moreover, I would argue that they are not unlike race or gender in being a phenotypic or visible attribute that becomes imbued with social meaning and that's becomes associated with health. And I, you know, I fully admit that directly equating body size with something like race or gender should be done with caution to the extent that these are social identities that are bound up with far more endemic and injurious legacies and systems of oppression, certainly in the United States, but abroad as well. That said, there are useful parallels.

Historical scholarship on race and health provides a very valuable reminder of how the essentialization of unfavorable traits, such as the color of one's skin, have been used to substantiate the alleged inferiority of a given group of people, suggesting some kind of causal relationship between race and poor health, but through decades of research, we have clearly dismissed this notion, showing that this relationship is attributable to race being a proxy for the many social ills that are inflicted upon individuals on the basis of their race. Body size has been problematized as an abnormal form of human variation, much in the same way that we observe biases towards other undesirable forms of human variation, past and present. In our highly weight conscious society, stigma on the basis of individuals' body size and weight remains a socially acceptable form of bias. Although this bias is perhaps not as overt as other forms, social, cultural, and health norms have helped to create and maintain a society where overweight adults are often not considered worthy of the normal standards of respect, thereby justifying active discrimination against them. That further diminishes their social and health outcomes.

The stigmatization of body size and obesity is seen in the chronic discrimination and bias against overweight individuals, social ostracism, harassment, and the internalization of negative self imagery and beliefs among individuals whose bodies do not conform to fairly narrow and restrictive social and medical norms for health and appearance. Research points to the relationship between weight stigma and discrimination, and numerous

mental and physical health outcomes such as depression, anxiety, psychiatric disorders, impaired cardiovascular health, and many, many others, over and above any contribution of individuals actual weight status. And yet, despite this growing body of knowledge about the many and complex non-biophysiological pathways through which body size might affect someone's health. And why a measure like BMI is capturing something other than some specific dimension of individuals health.

Most research and messaging continues to promote a fairly simplistic narrative. And maybe that has something to do with the fact that this very critical and reflexive perspective on thinking about and measuring health is not always feasible when conducting research. There are data and analytics limitations and frankly, in many instances it's just easier to set aside these issues, especially if they're not central to your arguments, I'm guilty of this as much as anyone else in the work that I do with BMI, on occasion. But I definitely encourage everyone to take time to consider some of the biases we have, at least when it comes to the all too common usage of body size and certainly BMI as a measure. First and foremost, how much do we know about the mechanisms explaining the association between body size and health, and whatever work that we're doing, that was the bulk of this talk and considering how the different ways we frame the measurement of body size as a dimension of health then inform our assumptions and interpretations.

I'm sure most of you are aware of the notion of the aggregate or ecological fallacy in research, which can be hard to avoid in the process of doing any work, especially depending on what data one has access to and at what level of aggregation and a whole lot of other factors. But the conflation of population level findings about body size or BMI and health, and the characteristics and choices of individuals is something that can be mitigated in the kinds of explanations for these associations that we choose to invoke, especially in differentiating biophysiological from psychosocial explanations. In turn, how does this inform recommendations and solutions about body size and health? And I feel like I don't need to elaborate on this too much as it's easy to see that a purely biomedical framing of body size and health related mechanisms takes one down the road of biomedical interventions primarily focused on weight loss, and the various means of achieving it. Conversely, greater knowledge of the social meaning and implications of having an admirable body may point us in the direction of social interventions that try to address the social norms and expectations about health and the body that give rise to poor health. But a question that I think researchers should be most aware of, and where I argue that they can make the biggest impact, is in asking what kinds of messages about body weight and health our research helps to perpetuate and reinforce.

So coming full circle and returning to the COVID example. It's important to consider what the effect of treating something like body size as a risk or marker of poor health just to the people who are defined by the label. So we want to raise awareness, but we do not want to give the impression that these people have done something wrong as that is harmful in its own right and only reinforces pre-existing social beliefs about the relationship between personal failure and health. I think that we forget that knowledge about health comes in no small part from knowledge and messages conveyed through research, sometimes directly, but often through processes of social diffusion. Thus, researchers have a responsibility to be very careful in their wording and explanations, especially because so much will already be lost in translation. So I know I mentioned race before, and while I again I'm not trying to somehow equate that with body size, it's a very illustrative case of how scientific explanations for the relationship between race and health have been used to perpetuate negative beliefs, such as genetic explanations of inferiority. Yet the relationship between race and health is also a great case study of how research has gradually reshaped social knowledge and promoting a narrative of race as a proxy for perpetual disenfranchisement and discrimination. That has substantial implications for the health of millions of children and adults.

So changing the framing of research, the kinds of explanations that we provide and the messages and interventions that come about, as a result, can hopefully allow for this greater weight neutrality in research, can manifest itself as greater weight neutrality in society at large. So thank you so much for bearing with me in this kind of long winded talk, but I'm very excited to hear what you have to say about this, and any and all feedback is always appreciated.