



The medical model of “obesity” and the values behind the guise of health

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Received: 4 November 2022 / Accepted: 24 May 2023 / Published online: 10 June 2023
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Abstract

Assumptions about obesity—e.g., its connection to ill health, its causes, etc.—are still prevalent today, and they make up what I call the medical model of fatness. In this paper, I argue that the medical model was established on the basis of insufficient evidence and has nevertheless continued to be relied upon to justify methodological choices that further entrench the assumptions of the medical model. These choices are illegitimate in so far as they conflict with both the epistemic and social aims of obesity research. I conclude the paper with a partial solution to these epistemic and social shortcomings.

Keywords Obesity research · Values in science · Aims of science · Medical model · Public health ethics · Participatory research

1 Introduction

One morning in June of 1998, twenty-nine million Americans with average figures woke up “overweight.” This was not a coincidence or a freak accident. It was not due to a nationwide eating contest or protest against exercise. Rather, it was a policy decision by the National Institutes of Health (NIH) to lower the maximum limit for “normal” weight on the Body Mass Index (BMI) scale from 27.8 for men and 27.3 for women to 25 for both men and women (Saguy, 2012). These people woke up one day “with a presumed increased risk of type 2 diabetes, hypertension, and atherosclerosis and a government prescription for weight loss” despite the fact that none of them had gained any weight (Bacon, 2010, p. 152).

The NIH’s decision relied on a 1995 World Health Organization (WHO) report (Bacon, 2010; Saguy, 2012; Oliver, 2006). The WHO report was written with the help of the International Obesity Task Force (IOTF), an organization whose first mission

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was to get the lower BMI standards imposed (Oliver, 2006), a mission that was not scientifically motivated by any new discoveries in obesity (Squires, 1998). The change was controversial. Some scientists fought the lowering of BMI standards because the science was inconclusive about what weight ranges should be considered healthy—some studies found no relationship between being overweight and an increased risk of mortality while others did, and some studies even found an *inverse* relationship (Troiano et al., 1996). That is, studies in the WHO report suggested that BMI standards should be raised, not lowered (Troiano et al., 1996; Saguy, 2012; Oliver, 2006, Bacon, 2010). Other scientists, however, were motivated by the studies that found evidence for viewing being overweight as a risk factor for mortality. IOTF members leading the charge had the most to gain from lowering the BMI thresholds, given that “seven of the nine members on the... [IOTF] were directors of weight-loss clinics, and most had multiple financial relationships with private industry” (Bacon, 2010, p. 152).¹ Indeed, the IOTF was at the time primarily funded by two weight-loss companies: Hoffman-La Roche (the maker of the weight-loss drug Xenical) and Abbott Laboratories (the maker of the weight-loss drug Meridia) (Oliver, 2006).

This policy change coincidentally occurred around the same time as the “Phen-Fen” controversy, which resulted in one of the most costly healthcare liability settlements in history. These diet pills were found to be linked to serious, life-threatening side effects like heart valve disease and primary pulmonary hypertension. The FDA had approved these diet pills despite recognized medical risks on the basis of the argument that obesity is a rapidly growing, serious health concern, and the risks of obesity are greater than the risks of the drugs. Obesity experts, pharmacists and family doctors went along with this argument (Johannes, 1997; Kolata, 1997; Langreth, 1997; Mundy, 2001; Pollack, 2012). A similar argument has also been used to encourage some patients to undergo gastric bypass surgery (i.e., the risks of obesity outweigh the risks of the surgery). Though perioperative mortality rates have dramatically decreased since the early 2000s (e.g., see Flum et al., 2005), there is still risk of mortality and short- and long-term adverse outcomes with gastric bypass surgery (Arterburn et al., 2020; le Roux & Heneghan, 2018). The message in both cases appears to be that anything is better than being obese (Shermer, 1983).

In this paper, I argue that these types of decisions—decisions that relied on the illegitimate use of values in science and science policy—played an essential role in establishing what I call the *medical model of “obesity.”* Despite problematic origins, the medical model has continued to play a role in obesity research in a self-vindicating way that conflicts with both the epistemic and social aims of research. The story of how BMI thresholds were lowered, for instance, demonstrates how non-epistemic values have illegitimately shaped the way we have come to understand obesity, and the assumptions of the medical model have preserved this illegitimately crafted concept

¹ For example, Xavier Pi-Sunyer was elected chair of the NIH task force on obesity in 1995 while simultaneously serving as a member on the WHO panel. During this time, Pi-Sunyer also served on the advisory board or was a paid consultant to several diet and pharmaceutical industries like Wyeth-Ayerst labs (the creators of the notoriously dangerous diet drug Fen-Phen that ended up causing heart valve damage), Knoll, Eli Lilly Pharmaceuticals, Genetechn, Hoffman-La Roche, Neurogen, and Weight Watchers International (Oliver, 2006).

of obesity. Researchers and policymakers made a deliberate choice to lower the “normal” weight threshold despite conflicting evidence thereby raising the bar for what society deems a “healthy body.” However, given the ways in which people in larger bodies are already discriminated against (e.g., in job opportunities and health care services)² and endure emotional and physical degeneration as a result of this discrimination (Tomiyama et al., 2014, 2018; Spahlholz et al., 2016, Vadiveloo & Mattei, 2017; Vartanian, 2008), this controversial decision was not in people’s best interest, contrary to what most people may think. In other words, the social aim of obesity research—i.e., to improve the health and well-being of people in larger bodies³—is not being fulfilled. After exploring how such illegitimate values have shaped obesity research and policy, I argue that to make progress toward achieving this social aim, obesity researchers should take seriously and incorporate the testimonies of people in larger bodies via participatory research. In other words, the problem with obesity research is not that values have influenced the research at all, but rather that the wrong kinds of values—values that do not further the social or epistemic aims of obesity research—have done so by means of the medical model.

The medical model is made up of three main dogmatic assumptions that defend the standard way of conceiving bodies and more specifically, obesity (Gordon, 2020; Harrop, 2019; Saguy, 2012; Gard & Wright, 2005). These three dogmas are: (1) Other things being equal and above a certain threshold, the more one weighs, the unhealthier one is (or vice versa)⁴; (2) An “overweight” or “obese” body is to some degree inherently unhealthy; and (3) People who are “overweight” or “obese” are so because they do not eat properly and/or do not exercise enough. This is not an exhaustive list of assumptions, but any account of obesity that upholds at least one of these dogmas would qualify as a medical model under my view.

This paper has two major aims. First, I identify epistemic issues besetting the medical model of fatness, which affect both how it was established (Sect. 2) and how it maintains itself in the face of recalcitrant evidence (Sect. 3). Furthermore, given that obesity research is intended to improve the health of people in larger bodies, the medical model functions in a way that conflicts with this social aim. Thus, my

² See, for example, Bellizzi and Hasty (1998), Giel et al. (2010), Vanhove and Gordon (2014), Tirosh (2012) and Roehling (2006) on ways in which people in larger bodies are discriminated against on the job market or in the workplace. See Sabin et al. (2012), Schwartz et al. (2003) on the prevalence in which doctors and obesity experts employ both implicit and explicit anti-fat biases.

³ Though the terms “overweight” and “obese,” are often used to describe people in larger bodies, fat activists consider it a slur (Chastain, 2020). For that reason, I will often use the phrase “people in larger bodies.” However, when explaining beliefs, assumptions, or ideas made by obesity researchers (including my characterization of the medical model), I will use the language that researchers use for clarity and accuracy (in scare quotes). The distinction, for example, between “overweight” and “obese” matter for accurately reporting obesity research. I will also refer to the “condition” as “obesity” and refer to the relevant kinds of research as “obesity research.”

It should be noted that fat activists are reclaiming the word fat, which is taken to be a *political* identity, to contest shame, express power, and expose the limitations of the medicalized language (Cooper, 2016). Should obesity researchers incorporate the perspectives and testimonies of fat activists in their research (as I recommend in Sect. 4), there may be hope for abandoning the medical model, and with it the stigmatizing language it employs.

⁴ I do not think medical professionals consider people who are “underweight” to be healthier than those who are “normal weight” or heavier. This is why I add the quantifier “above a certain threshold.”

second aim in this paper is to propose a partial solution to the epistemic and social shortcomings of obesity research (Sect. 4).

2 Fulfilling the aims of obesity research

Philosophers of science have argued that the scientific methods used in research should be chosen with regard to the aims of research (e.g., Intemann, 2015; Brown, 2020; Potochnik, 2015). This is in part because methods may sometimes “carry value commitments” (Crasnow, 2020). In the context of obesity research, I argue that the medical model has been relied upon to justify certain methodological choices that have in turn prevented researchers from achieving their purported epistemic and social aims. As I show, the medical model carries problematic value commitments regarding obesity.

The aims of research can sometimes be made apparent by the language researchers use. Certain scientific hypotheses and goals are value-laden in themselves because they contain normative concepts (Intemann, 2015). In the context of climate change, hypotheses and research questions may contain words—like “dangerous,” “vulnerabilities,” “losses”—that we take to be important in that they bear on human (and environmental) flourishing (Ibid., 223). In the context of obesity research, words such as “health,” “harmful,” “unhealthy,” “deadly,” “disease” are pervasive and obesity researchers use them to motivate their projects—projects that often assume obesity to be a serious and life-threatening disease. This language makes it particularly difficult to separate the strictly epistemic aims of obesity research from the strictly non-epistemic aims.⁵ But even if research questions or hypotheses do not contain normative concepts, how a phenomenon is measured or conceived depends on *why* we want the information, which will often require appealing to social and ethical value judgments (Intemann, 2015).

One could say that the general aim of obesity research is something like: using science-based research to understand the nature of obesity in order to promote health and well-being. If we break this statement into parts, we can see that one specific goal of obesity research is to generate accurate beliefs about the biological processes happening in the body, specifically as it relates to the accumulation of adipose tissue (i.e., an epistemic aim). However, this goal matters as much as it does because we need this information in order to carry out another goal—giving appropriate advice to people who are “overweight” or are susceptible to becoming “overweight” (i.e., a non-epistemic aim). In other words, researchers care about generating accurate beliefs about obesity to help those who are most affected (i.e., the stakeholders).

Given that obesity research has clear social, political, and economic implications for many people in our society, it is understandable that we should “want our public policy

⁵ As Alexandrova (2017) argues, concepts like “health” and “well-being” are partly normative and partly factual in that their definitions and measurements depend on moral claims about what is required to be healthy or have adequate levels of well-being. Thus, many claims found in obesity research (and the medical model dogmas) may be considered what Alexandrova calls “mixed claims” in that these statements are essentially “scientific hypotheses that rely on both factual and normative categories” (Ibid., 79). Even the terms “obesity” and “overweight” are in themselves value-laden. Measurements may not be value-laden on their own and without reference to some kind of ranking or classification system, but when such measurements are used to categorize bodies as diseased, non-epistemic values are involved.

making to be democratically legitimate, accountable to the public, and representative of the range of our values” (Brown, 2020, p. 73). This requires that researchers prioritize values such as social justice, diversity, inclusion, and equality in their research that informs public policy. Furthermore, since certain groups of people are disproportionately and systemically affected by obesity research and its recommendations for public policy (e.g., people in larger bodies, people of color, impoverished communities),⁶ obesity research needs to place more emphasis on the interests and participation of these stakeholders who are most affected and particularly, those who are most vulnerable (Brown, 2020; Intemann, 2015). In addition, ensuring that a broad range of criticism is carefully considered will help to ensure that any scientific consensus arises not as a result of economic or political power nor through the exclusion of other perspectives but rather, as “a result of critical dialogue in which all relevant perspectives are represented” (Longino, 2002, p. 131). This means that we ought to incorporate not only the views of people who are most impacted by this research (e.g., people in larger bodies), but also people who also have strong criticisms against the research (e.g., fat activists and fat justice scholars).

The problem with obesity research is not that values are present but rather, that these values are often “uncritically accepted without justification by a rather monolithic group of those practicing science” (Intemann, 2017, p. 131; see also Longino, 1990, 2002). Researchers may not question their research goals, the ways they collect data, or the models that they use because they may have, for instance, grown accustomed to following a precedent and been unknowingly influenced by what the scientific community takes to be valuable about what they are studying.⁷ Obesity research has focused on the ways in which obesity is correlated with poor health outcomes and the most effective interventions because of the heightened concerns that have been brought about by research that presumably established the medical model. Decisions about what statistical methods to use, what to take as data, how to collect and interpret the data, which confounding factors to account for, etc. do not simply rely on epistemic (or cognitive) values like logical consistency, simplicity, testability, and predictive accuracy, but also on non-epistemic (or noncognitive) values, including researchers’ goals, interests, and responsibilities, as well as broader cultural norms. In this way, research can fail to promote even its epistemic aims by failing to explore other worthwhile research questions, recognize broader ranges of evidence, and adopt other conceptual schemes.

Incorporating values like justice, diversity, and inclusion has the potential to improve both the social and epistemic aims of obesity research. Implementing non-epistemic values such as these elevates the interests and perspectives of stakeholders and what they take to be valuable about the research, which has the potential to make

⁶ See, for example, Puhl and Heurer (2010) and Dinour et al. (2007) for discussions on how these populations are disproportionately affected by obesity research.

⁷ For example, if a conservation biologist is gathering data to determine if a species is endangered, then she may interpret the count in a way that would justify imposing regulations on hunting or development (Intemann, 2015). The biologist’s value judgements are not used to determine how many species exist, but they may be used to determine the conceptual scheme that will be used to interpret the data. For instance, decisions about what to count as members of a species and what total number of a species is considered troubling will depend on the conceptual scheme employed.

the research most epistemically fruitful (Anderson, 2004). When incorporating diverse perspectives and perspectives of stakeholders, the norms of inquiry and what is taken to be valuable are not only questioned, but questioned by the people who have the most to lose (Brown, 2020).

3 Definitions, categories, and choices that established the medical model

In this section, I argue that the medical model was established on the basis of insufficient evidence. I will show how each dogma was established by an unforced choice and how values illegitimately shaped that choice. I am *not* criticizing the way the evidence bears on certain hypotheses. Rather, I am calling attention to the ways that values and assumptions have played a role in promoting an overly narrow and pathologized perspective of fatness in face of conflicting evidence and in ways that impede the social aims of obesity research.⁸ In Sect. 3, I will demonstrate ways in which obesity researchers have relied on these assumptions in their research thereby affecting their methodological choices.

3.1 Dogma 1: The more a person weighs, the unhealthier they are (beyond a certain threshold)

In order for the first dogma of the medical model to be established, or for there to be a neutral and quantifiable way to determine who should be considered unhealthy, an agreed upon unit of measurement for body weight/size was required. Before the controversy of determining what BMI ranges should be considered “overweight” or “obese,” there was (and still is) controversy surrounding the decision to rely on the BMI at all. Part of the controversy stems from the fact that the calculation for BMI—developed by a Belgian astronomer, Adolphe Quetelet—was designed merely to classify the population for the purpose of a statistical experiment (Oliver, 2005).

The Quetelet index calculations were later used by health insurance companies to determine which insured populations had the most desirable or least desirable ratios of weight and height in respect to their mortality rates (Nuttall, 2015), despite the fact that Quetelet did not use BMI to make predictions about an individual’s level of disease, health, or likelihood of mortality (Oliver, 2005). Like Quetelet’s sample—i.e., an exclusively white, European group—the data used by health insurance companies on mortality risk and BMI were based almost exclusively on wealthy white men. As a result of these historical methodological choices, BMI fails to account for variations

⁸ In this paper, I am criticizing the choice of model that provides the background assumptions against which we interpret evidence, which is different from criticizing whether or not the evidence—given the assumption of one or another model—supports a hypothesis. In this section, I provide some historical and educational background on why the medical community adopted the medical model of fatness and the ways values illegitimately influenced this decision, particularly given the social aims of obesity research. I thank an anonymous reviewer for urging me to clarify this point, and I thank Paul Franco and Rose Nozick for helping me formulate it.

in race/ethnicity, age, gender. It also fails to account for variations in body composition—i.e., proportions of fat, muscle, and bone mass (Campos, 2004; Gard & Wright, 2005). For example, many professional athletes—despite their low body fat and/or high levels of cardiorespiratory fitness—are considered “overweight” and even “obese” by BMI standards because of the amount of muscle they have on their bodies. BMI calculations also distort the fat assessment of women, given that women are statistically shorter and have higher levels of adipose tissue than men (Gard & Wright, 2005).

BMI is not just a poor measure of body fat; it is also a poor measure of health (Tomiya et al., 2016). Nevertheless, BMI is being used as a “risk-prediction tool” for health (Glassman, 2022). If people are considered “obese” or even “overweight” on the BMI scale, it is assumed that they are less healthy and at an increased risk of developing certain illnesses or diseases. However, research on the increased susceptibility of people in larger bodies to disease and mortality is inconclusive (Bacon 2010, Lavie, 2014). BMI is also an inaccurate tool for measuring the health of a *diverse* group of individuals. For example, while black women in general have higher BMIs than white women, they actually have lower mortality rates at a given BMI (Campos, 2004; Strings, 2019). As age increases, the link between obesity and mortality diminishes significantly and has even been said to be nonexistent in some studies (Bender et al., 1999; Heiat et al., 2001). Additionally, data from a larger and more diverse sample group have shown that people who fall in the “overweight” BMI category have the lowest mortality risk and there is only a slightly increased risk of mortality among “obese” people (Flegal et al., 2005).⁹ When making predictions about people’s health based on their BMI, the predictions need to rely on the distribution curve for the relevant demographic or run the risk of making poor predictions about the health of certain social groups.¹⁰

Despite these weaknesses, BMI continues to be used widely to measure body fat and gauge the health of all individuals, and as a result, the legitimacy of BMI to accurately measure body fat and health has been assumed in obesity research methodology and in public health approaches to obesity. In the 1990s the World Health Organization (WHO) decided to use BMI to categorize different body weights and heights into groups such as “underweight,” “normal weight,” “overweight” (sometimes called “pre-obese”), and “obese.” Other government health agencies, like the NIH and Centers for Disease Control and Prevention (CDC), also rely heavily on BMI as the primary indicator of weight, health, and mortality risk of Americans. While some public health agencies and researchers recognize that BMI does not accurately calculate body fat or accurately predict health, it is still widely used for these purposes because it is easy to calculate and quantifiable (Jutel, 2017). While being easy to calculate and

⁹ As I will discuss in Sect. 3, an inverse relationship between body fat and risk of death has been observed across various illnesses and diseases—a phenomenon that has been called the “obesity paradox.” Though obesity has been said to contribute to the development of certain diseases (e.g., cardiovascular disease), it has been argued that obesity becomes *protective against mortality* once the disease sets in (e.g., see Lavie, 2014).

¹⁰ It may be the case that BMI could be appropriately used to confirm a doctor’s suspicions that a patient is “underweight,” however, given the very small percentage of Americans who are considered underweight, this method of measurement should not be the norm. Additionally, as noted previously, dogma 1 does not extend to this category of persons.

quantifiable could count as legitimate reasons to choose one method of measurement over another, following the aims approach, the method for measuring adiposity should still satisfy our other aims—i.e., generating accurate beliefs about health or at the very least, accurately measuring body fat—which BMI does not do.

3.2 Dogma 2: An overweight body is unhealthy

The second dogma of the medical model demarcates bodies that are “unhealthy” or “diseased” from those that are presumably “healthy.” Though obesity has been treated as a medical condition and, more specifically, a disease, at various times in history, the justifications for doing so have been inconsistent and socially laden (Rasmussen, 2019). The current obesity epidemic was arguably triggered by the work of William Dietz and Ali Mokdad in the late nineties (Oliver, 2006). In 1999, Dietz along with other scientists, including Mokdad, presented obesity rates in the U.S. in a way that made obesity look more like a rapidly spreading transmittable disease than merely a form of human variation with increasing prevalence (Mokdad et al., 1999). They illustrated the growing rate of obesity with a series of color-coded maps on a Power-Point slideshow—light blue represented the lowest obesity rates (less than 10%), dark blue represented increasing obesity rates (between 10 and 20%), and the states turned red when the obesity rate exceeded 20%. The maps showed the growth of obesity as the dates progressed from 1985 to 1999. The presentation of the data was alarming because the maps appeared to illustrate something akin to a spreading infection: “As the redness moved from one state to others nearby, it seemed to demonstrate that obesity was infecting the population with virus-like speed” (Oliver, 2006, 614). The authors believed their map was an effective rhetorical tactic for convincing others that obesity was a national threat, and they were right.

Mokdad et al. (1999) has been cited over three thousand times, including by Surgeon General Dr. David Satcher in “The Surgeon General’s Call To Action To Prevent and Decrease Overweight and Obesity” in which he referred to obesity as an *epidemic* (Office of the Surgeon General, 2001). After Mokdad et al. (1999) presented their work in various venues and made their maps publicly available on the CDC website, this framework for viewing obesity spread like wildfire despite the misleading nature of the maps (Oliver, 2005).¹¹ Dietz and Mokdad made the conscious choice to display obesity in a way that would attract attention by taking advantage of moderate pre-existing fears surrounding obesity (Oliver, 2006). The national conversation shifted

¹¹ We all know that obesity is not a transmittable disease, however, these maps were misleading due to the way the data was presented, making it look like obesity was a spreading infection that was migrating from state to state. What the maps actually showed was the percentage of people in each state with a BMI over 30. The real reason states like Mississippi, Alabama, and West Virginia were some of the first states to turn red was because they are located in largely rural and poor parts of the country, not because an outbreak occurred there. This data is also misleading given that states that are geographically large but have smaller populations (e.g., North Dakota) are being viewed as equivalent to those that may appear geographically small but have larger populations (e.g., Pennsylvania). As a result, for a state like North Dakota to turn red only 228,600 people need to have a BMI over 30, whereas Pennsylvania would need a whopping 3,840,000 people. However, by just looking at the map, when states like North Dakota turn red, it makes it appear as though a large proportion of the U.S. population is obese given that a larger proportion of the map has turned red, but this isn’t the correct way to interpret the map.

from whether obesity is linked to health issues to *what should be done* about its increasing incidence.

Although the idea of an “obesity epidemic” started in the 1990s, it wasn’t until June 2013, that the American Medical Association (AMA) passed Resolution 420 and declared obesity a disease. Shortly thereafter, several other organizations followed suit. While the AMA’s decision did not have any legal authority, having the nation’s largest physician group make this decision certainly portrayed obesity in an alarming way. This decision, however, was made despite the objections raised by the AMA’s expert committee, the Council on Science and Public Health (Greenhalgh, 2015; Pollack, 2013).

The expert committee argued that obesity should not be considered a disease for several reasons. First, as already discussed, the BMI calculation for determining obesity is overly simplistic and fails to reliably predict a person’s level of health due to its failure to account for variations in body composition, gender, and race/ethnicity among individuals. Second, obesity does not easily fit the definition of disease: when a condition is called a disease it typically means the body’s normal functioning has gone wrong, but accumulating fat is the body’s normal response to a set of circumstances (e.g., stress, famine) (Brown, 2015). Third, there are no specific symptoms (e.g., sleep apnea, immobility, metabolic abnormalities) that are always, or even usually, associated with obesity (Brown, 2015; Greenhalgh, 2015).¹² There are people in larger bodies who are metabolically healthy and have no mobility or joint issues and there are people of normal weight who suffer from metabolic abnormalities. Obesity itself has no “characteristic symptoms”—the accumulation of adipose tissue is the definition of obesity, not a symptom of obesity (AMA, Council of Scientific Affairs Report, 2012).¹³

Moreover, they recognized that viewing obesity as a disease would suggest that all people in larger bodies are unhealthy to some extent. The expert committee worried that defining one-third of Americans as diseased could lead to more reliance on costly drugs and surgery (Pollack, 2013). In sum, the committee felt that recognizing obesity as a disease would not improve health outcomes—which, as previously discussed, is a central aim of obesity research (Brown, 2015; Greenhalgh, 2015).

Nevertheless, the AMA decided to call obesity a disease. Surprisingly, they claimed to have made this decision due to an “overabundance of clinical evidence” (AMA House of Delegates 2013, p. 1). Yet their own expert panel was not convinced. Clearly the available evidence was less than persuasive.

The AMA’s ultimate decision relied on reasons such as: obesity contributes to other illnesses that impair bodily function; obesity is associated with symptoms such as joint pain, sleep apnea, immobility, and low self-esteem; and weight-loss from lifestyle,

¹² A report by the expert committee explains how there is no one definition of disease that encompasses all diseases accepted as such, and thus, no symptoms are dead giveaways for classifying something as a disease. A community’s decision on calling something a disease has been “heavily influenced by contexts of time, place, and culture as much as scientific understanding of disease processes” (AMA, Council of Scientific Affairs Report, 2012, p. 4).

¹³ This conception of obesity has changed in recent years, as organizations like the World Obesity Federation and The Obesity Society have moved to define obesity as a disease, not as a BMI range or as the accumulation of adipose tissue. The physiological conception of obesity has become more nuanced in the past decade as a more sophisticated understanding of adipose tissue has developed (Cypess, 2022).

medical therapies, and bariatric surgery could reduce mortality and improve health (AMA House of Delegates, 2013).¹⁴ However, their list of symptoms that accompany the accumulation of body fat is seriously problematic. Consider, in particular, the symptoms of immobility and low self-esteem. A large percentage of “obese” people are mobile and have an active lifestyle. The CDC reports that 40% of the U.S. population is “obese” (CDC, 2022), but only 11% of the population, for various reasons—not only due to obesity—is immobile (CDC, 2023).¹⁵ Additionally, a person may not be simply limited by their body but also by their environment—for example, small seats/desks or narrow aisles on public transportation may severely limit a person’s options for movement and may deter people from trying to move.¹⁶ Building on this point, the symptom of low self-esteem is also problematic in that it is clearly not a biological effect of obesity but rather, a social effect of living in an environment that is not welcoming of people in larger bodies and therefore, should not serve as a reason to pathologize obesity.¹⁷

The story of how the AMA decided to classify obesity as a disease clearly echoes discussions in philosophy of medicine regarding how we should define concepts like disease and health (e.g., see Boorse, 1975; Aronowitz, 2001). Other scholars have used the case of obesity to motivate general discussions in philosophy of science such as: the complexities of calling certain bodily conditions, such as obesity, a disease (e.g., Ershefsky, 2009; Reznek, 1987); the sociological issues around disease classification (Jutel, 2017); the best models for epidemiological explanation (Broadbent, 2009); and how helpful causal inferences are in helping us make predictions about the effectiveness of disease interventions (Fuller et al., 2015). For my purposes, the story is simply an example of how values illegitimately influenced decisions that led to the

¹⁴ I will discuss later the controversy surrounding the AMA’s claim that weight-loss from lifestyle, medical therapies, and bariatric surgery could reduce mortality and improve health. I will also discuss a phenomenon called the obesity paradox, which also calls into question the AMA’s claim that obesity impairs bodily function.

¹⁵ This isn’t to say that there is no association between weight and mobility but rather, there are many people in larger bodies who are mobile and even *active*. The category “obese” consists of a wide range of body sizes and shapes. Many professional football players and basketball players, for instance, are considered “obese” and yet, they have incredible fitness capacities and are unquestionably mobile (Lavie, 2014). Thus, given the number of people in larger bodies who are mobile and/or active, it doesn’t seem fitting to say that immobility is a symptom of obesity.

¹⁶ Similar arguments have been made by disability scholars to say that it is not the body itself that is disabling but rather, the environment we live in—that is, such arguments support a social model of disability (as opposed to a *medical model* of disability) (see, e.g., Oliver, 1996).

¹⁷ I should note that as the medical understanding of obesity has become more nuanced, so too have arguments that obesity is a disease. For example, Kilov and Kilov (2019) argue that obesity meets the criteria for disease from both a naturalistic and constructivist conception of obesity. However, these authors make similar conceptual mistakes as the AMA in some cases. They too treat stigma as a harm of obesity rather than that of fatphobia. They also make the unlikely assumption that calling obesity a disease will improve patient outcomes. Given the prevalence of anti-fat beliefs among health care providers (Sabin et al., 2012; Schwartz et al., 2003), simply calling obesity a disease will not change the assumptions health care providers make about patients in larger bodies. I thank an anonymous reviewer for pushing me to mention how the medical understanding of obesity has become more nuanced since the AMA ruling. I would argue that the way current recommendations of healthcare providers and public health organizations are still relying on certain medical model assumptions (see Sect. 5) demonstrates that these nuanced understandings of obesity are not widely held and/or they are not as nuanced as they should be.

development of the medical model—a model that has been used in ways that further entrench the assumptions therein and does not promote democratically endorsed aims.

3.3 Dogma 3: People are overweight because they do not eat and/or exercise appropriately

The third dogma focuses on the assumption that individuals can manage their weight through eating and exercise. Because of it, individuals are often blamed (or praised) for their body size. The stigmatization of people in larger bodies has endured despite the AMA expert committee's conjecture that calling obesity a disease would reduce weight stigma (Pollack, 2013). They thought that defining obesity as a disease might encourage people to view obesity as something that people do not have full control over. However, our society's fixation on how to stop the obesity epidemic sustained the belief that obesity is *curable and preventable*. The expert committee's consideration of how categorizing obesity as a disease could reduce weight stigma—an aim that would be democratically endorsed in that it would be informed by the non-epistemic values of the stakeholders—was laudable, but they failed to foresee how society's desperate attempts to treat the disease would further harm the stakeholders. In fact, the AMA's decision to call obesity a disease was motivated by the medical community's desire to "advance obesity treatment and prevention," as stated in Resolution 420 (AMA House of Delegates 2013, p. 2; see also Brown, 2015 and Mundy, 2001).

Dogma 3 reflects a common belief about obesity—that it is caused by poor eating choices and inactivity. Consequently, public health organizations have been promoting healthy eating and exercise in an effort to reduce the prevalence of obesity. Put differently, it is a common misconception that obesity is personal responsibility (Reiheld, 2015)—if you are unable to achieve "normal weight," you are simply doing something wrong or are not doing enough. In other words, underlying the assumption that obesity is a personal responsibility is the belief that intentional and long-term weight-loss is *achievable*. This story is further motivated by obesity experts and healthcare providers who call attention to the National Weight Control Registry (NWCR) as proof that people can successfully lose weight and maintain their weight-loss. Though it is true that some people succeed at permanently losing weight, portraying them as role models gives people a false sense of optimism about their own potential for weight-loss and deludes others (i.e., healthcare professionals) into believing that weight loss is a realistic goal, thus perpetuating the stigmatization of people in larger bodies (Ikeda et al., 2005). So, not only is it assumed that weight-loss is achievable but also that people who achieve weight-loss are "typical" and those who don't achieve weight-loss are atypical (Ibid.).

This assumption is allegedly defended by the long history of research suggesting that if people simply eat and/or exercise in a particular way that they will lose weight and become healthier. However, many of these studies are biased because they exclude participants who do not attend the follow-up appointments (two to five years after the diet ends) for unknown reasons. Such participants may not have attended these follow-up appointments because they had gained back the weight (Mann et al., 2007). If so, excluding them makes the diets appear more effective than they actually were. Plenty of

evidence shows that most people who are able to intentionally lose weight through diet and exercise are unable to keep the weight off long-term (e.g., see Mann et al., 2007; Howard et al., 2006; Garner & Wooley, 1991; Kassierer & Angell, 1998). Additionally, weight-loss drugs like Redux, for example, only produce about a 3% weight-loss compared to taking a placebo, but one of the selling points from the pharmaceutical company was that “even a small weight loss was better than none” (Mundy, 2001, p. 65). Bariatric surgery is another option for people that may result in weight-loss and improvements in metabolic health. However, this kind of elective surgery comes with some serious risks, may result in short- and long-term complications (Heymsfield & Wadden, 2017), and even then, for some procedures, 30% of patients do not maintain their weight loss (Berg, 1999; Bacon & Aphramor, 2011).

So, what accounts for the persistence of the view that diet and exercise can reverse weight gain (Vartanian, 2010)? Maintaining that view certainly benefits the pharmaceutical, self-help, weight-loss, and diet industries (Jutel, 2017; Mundy, 2001). Many obesity researchers are on the payrolls of pharmaceutical and weight-loss companies (Brown, 2015; Fauber & Gabler, 2012; Oliver, 2006). Additionally, prominent obesity researchers have diet books and programs to sell and thus benefit from obesity being perceived as something that is curable (Brown, 2015). In addition to profit motives, though, physicians may believe that without dogma 3, people will stop caring about their health and start rapidly gaining weight. In this sense, dogma 3 serves to put the brakes on people’s behavior. Fat activist Lynn McAfee discloses in an interview a conversation she had with her doctor where she asked why the failure rates of diets aren’t communicated to the public. Her doctor’s response was that “no one wanted to discourage people from dieting” (Shanewood, 1999). But if dieting doesn’t work, why recommend it?

In sum, the decisions that established these three dogmas were illegitimately made in that they were based on insufficient evidence and for reasons that are clearly not in the stakeholders’ best interests—that is, these decisions were neither epistemically or socially justified. BMI is still heavily relied upon, because it is easy to measure and quantifiable, despite the fact that it is a *poor measure of body fat and health*. The decision to call obesity a disease was made despite the expert committee’s recommendation against doing so on the grounds that there was *insufficient evidence for thinking it would improve health outcomes*. And losing weight is still widely viewed as a typical effect of changing one’s diet and exercise regimen *despite conflicting evidence and the stigmatizing effects it has on the stakeholders*.

4 The dominant conception of obesity and its influence on research

I will now offer two examples illustrating how the medical model has functioned to preserve and further entrench itself. These examples demonstrate how the medical model influences how future evidence is collected and interpreted. As a result, obesity research is failing to achieve its epistemic aim of generating accurate knowledge about obesity.

4.1 Example 1: Mokdad et al. (2004)

In Mokdad et al. (2004), researchers examined the causes of death that are attributed to a “number of largely preventable behaviors and exposures”—one of which is “poor diet and physical inactivity.” The authors determine that 400,000 deaths occur as a result of this preventable behavior, and they describe these as deaths linked to obesity. The article, however, uses all three assumptions outlined in the medical model to justify this decision. Dogma 1—the more people weigh, the unhealthier they are—supports their conflation of those who have a poor diet and are physically inactive with people who are obese, thereby automatically excluding unhealthy people of normal weight (or underweight) when they should be included and including healthy people in larger bodies when they should be excluded. Dogma 2—an overweight or obese body is to some degree inherently unhealthy—supports their presumption that it is obesity itself (as opposed to some other variable or a host of other variables) that caused the 400,000 deaths. And dogma 3—people who are overweight or obese are so because they don’t eat properly or exercise enough—clearly justifies the authors’ assumption that obesity is “due to,” or caused by, poor diet and inactivity. This is a gross oversimplification of how obesity occurs (e.g., see Mann et al., 2007; Howard et al., 2006; Gardner et al., 2007); causal questions regarding obesity and ill health are not so straightforward.

To make the inferences they made in their study, the authors conflated poor diet and physical inactivity with obesity. They write: “To assess the impact of poor diet and physical inactivity on mortality, we computed annual deaths due to overweight” (Mokdad et al., 2004, pp. 1238–1239). The researchers chose to use weight as a proxy for diet and physical activity in order to mimic the methodology used in Allison et al. (1999), a study that was actually calculating the number of deaths attributed to *obesity*, not poor diet and physical inactivity. An additional complication with using the same procedure as Allison et al. (1999) is that the statistical method used was not adjusted correctly for confounding factors (i.e., sex and age).

To determine the annual deaths attributable to obesity in a particular year, epidemiologists need to determine the number of deaths in a given year, the prevalence of obesity, and the relative risk of mortality associated with obesity (or RRO) (Flegal et al., 2004a). Determining the estimated annual deaths attributable to obesity can be challenging primarily because of the ambiguity of what value to assign to the RRO. The relative risk of any disease can be calculated by comparing the risk of a health event in one group versus another group. In the case of obesity, the relative risk is determined by dividing the death risk of obese individuals by the death risk of non-obese individuals. Typically, the value assigned to RRO lies somewhere between 1.0 and 2.0, and a difference of a few tenths could vastly alter the number of deaths said to be attributed to obesity (Flegal et al., 2004b). An RRO of 1.0 means the risk of death is equal between the two groups; an RRO greater than 1.0 shows an increased risk of death for the exposed group (i.e., obese people); and an RRO less than 1.0 means there is a decreased risk of death among the exposed group.

Data can be manipulated in several ways to increase the RRO value thereby making obesity appear more deadly. For example, this could happen through data trimming¹⁸ or, as was the case with Allison et al. (1999) and Mokdad et al. (2004), it can happen when researchers do not correctly adjust their statistical methods to account for confounding factors, such as sex and age. It is estimated that 75% of all deaths among adults occur between persons aged 65 years and older, and it is estimated that 37.5% of all deaths among adults occur in persons aged 80 years and older, even though they make up less than 5% of the population (Flegal et al., 2004a, 2004b). Given that most deaths among adults occur in older individuals and the considerable evidence suggesting that obesity does not adversely affect mortality among older persons (e.g., see Waaler, 1984; Bender et al., 1999; Heiat et al., 2001), calculating the mortality risk attributed to obesity must take into account the RRO for subgroups within the population (i.e., age subgroups but also sex subgroups) or else risk overestimating the number of deaths attributed to obesity. Allison et al. (1999) only “partially adjusted” for confounding by using an overall relative risk that was adjusted for subgroup membership rather than different relative risks within sex and age subgroups, which led to a 17% overestimation of deaths due to obesity (Flegal et al., 2004a). Employing Allison et al.’s (1999) methods in their study explains in part the “striking finding” that approximately 400,000 deaths “occur annually *due to poor diet and physical inactivity*” (Mokdad et al., 2004, p. 1242, emphasis added).

Mistaking an association between poor diet and/or lack of exercise and obesity as a causal relationship has also led researchers to overlook other potential causes of mortality.¹⁹ For example, as Mokdad et al. (2004, p. 1243) note, “In this study we also did not examine the effects of high blood pressure and cholesterol or lipid profile on mortality, although some of the effects of these factors are mediated through poor diet and physical inactivity.” They overestimated the excess mortality rates of people with poor diet and physical inactivity by not taking into account the possibility that it was the high blood pressure or high cholesterol (and not obesity itself) that contributed to their estimates on mortality. Choices like this are common and inflate the estimated numbers of deaths thought to be attributable to obesity. Researchers are not typically called to defend this methodological choice (because it seems straightforward according to the medical model) nor are they expected to explain how this choice influences their numbers.

¹⁸ Data trimming sometimes occurs when researchers, usually out of good faith, attempt to isolate the effects of obesity on mortality by excluding certain populations from their calculations. For example, researchers often (1) exclude deaths that happen early on in the follow-up period (i.e., shortly after the enrollment period) for the reason that these deaths were thought to be due to pre-existing illnesses, (2) control for the effects of smoking by excluding current smokers and former smokers, (3) exclude participants with other specific health conditions at baseline (e.g., participants with heart disease or cancer), and (4) exclude people who are hospitalized or in nursing homes (i.e., a large proportion of the older population) (Flegal et al., 2004a, 2004b).

¹⁹ I am not denying that there may be an association between poor diet and/or lack of exercise and obesity. However, my point here is to say that the relationship is far more complicated than people typically think. Assuming that people in larger bodies exhibit these kinds of behaviors is problematic given the stigmatization and discrimination that follows.

Other obesity researchers, such as Katherine Flegal, have argued that it is very difficult to determine the number of deaths that are attributable to obesity alone.²⁰ Flegal et al. (2004a) published their own numbers and found that Mokdad et al. (2004) overestimated the number of excess deaths by nearly 300,000 and that there were no excess deaths associated with overweight people (just obese people). Mokdad et al. (2004) had to publish a correction the following year (Mokdad et al., 2005). Flegal et al. (2004a) explain that this most likely happened because most scientists have attempted to calculate this number by determining the “statistical excess of deaths among people who are obese, relative to people who are nonobese, rather than on identifying obesity as the specific cause of death for an individual” (1486). Calculating this number is particularly difficult when we consider all the possible contributing factors of obesity, ill health, and mortality, as I show in the second example.

Despite its strengths, Flegal et al.’s research (2004a) received an unusual amount of criticism, and Flegal (2021) published an article which disclosed the kinds and instances of harassment and disparaging comments she received in response to this article. Many of her critics attempted to defend Mokdad et al.’s (2004) research in spite of its shortcomings. Despite consistently flagging the strengths of their work compared to others, explaining why their estimates for mortality were more accurate than previously reported, and even after defending the results of their study in various subsequent publications (e.g., Flegal et al., 2013), Flegal experienced years of unrelenting and unwarranted criticisms.²¹ The nature and magnitude of the attacks Flegal received for her work convinced her that scientific research on a controversial topic like obesity will not be evaluated on the quality of the research but instead on how well it corroborates the dominant narrative:

At first, I was startled, but eventually I came to expect partisan attacks masquerading as scientific concerns. I had expected some modest interest in our findings, pursued through normal channels of scientific discussion. I had not expected an aggressive campaign that included insults, errors, misinformation, behind-the-scenes gossip and maneuvers, social media posts and even complaints to my employer...It seemed that some felt that our work should be judged not on its merits but rather on whether its findings supported the goals and objectives of the interlocutors. I saw first-hand the antagonism that can be provoked by inconvenient scientific findings...Development of public health policy and clinical recommendations is complex and needs to be evidence-based rather than belief-based. This can be challenging when a hot-button topic is involved. Scientific findings should be evaluated on their merits, not on the basis of whether they fit a desired narrative. (Flegal, 2021, p. 78, emphasis added)

Again, the question we should ask is what foundational assumptions are these criticisms of Flegal’s work relying on? Since one of the controversial inferences derived

²⁰ When calculating deaths that are “attributable” to obesity, the number does not refer to deaths that can be said to have been *caused by obesity alone*. The statistical excess deaths attributed to obesity will include cases in which “obesity itself *may not be the only contributing factor* to this statistical excess, but rather a *marker for other factors* such as sedentary behavior or adverse body fat distribution” (Flegal et al., 2004a, p. 1486, emphasis added).

²¹ See Flegal (2021) for a list of all published responses to her critics.

from Flegal's results is that being overweight is healthier than being "normal weight," it is likely that her critics endorse dogma 1 (i.e., that the more one weighs, the unhealthier they are). It may also be the case that well-meaning critics are assuming that obesity is inherently bad (dogma 2) and therefore believe that any evidence that is not incriminating could be "detrimental to public health goals" (Ibid., 76).

While the goal of improving public health is laudable, we must first ask whether Flegal's evidence is in fact detrimental to this goal and *also* whether it is detrimental to the epistemic goals of obesity research. It is not clear why Flegal's research—which was reviewed extensively by scientists at the CDC and NCI as well as journal reviewers and editors, is still cited frequently, and has been confirmed by other research—should be viewed as something that is detrimental to the epistemic aims of research. In fact, the opposite is probably true. Rather, it is Flegal's critics who want to "stomp out" (Raeburn, 2007)²² any ideas that conflict with the dominant narrative that obstruct the epistemic aims of research. Provided that Flegal's research is beneficial to obesity research—i.e., by challenging strongly held biased beliefs about the health statuses of "overweight" and "normal weight" people—it is also very unlikely that her research is detrimental to the social aim of improving public health.

4.2 Example 2: Ades and Savage (2010)

The "obesity paradox" is a concept that was coined by Luis Gruber and colleagues in 2002 to describe the circumstance in which, contrary to their hypothesis, thinner patients' risks of dying were roughly double that of overweight or obese patients within a year after undergoing angioplasty (Lavie, 2014). Since then, the obesity paradox, or the phenomenon suggesting that there is an inverse relationship between body fat and risk of death, has been observed across various diseases (e.g., see Hainer & Aldhoon-Hainerová, 2013; Lavie et al., 2003; Kalantar-Zadeh & Kopple, 2006). In the case of type II diabetes, for instance, it has been shown that type II diabetics who are overweight and even obese outlive their normal weight counterparts (Han & Boyko, 2018).

The obesity paradox has raised controversy among obesity researchers because it calls into question the correlation between obesity and mortality and suggests that obesity may actually be *protective* against death in some cases. In response, critics have tried to debunk the obesity paradox as a myth.

Consider the work of Ades and Savage (2010). Three central problems arise in this article. First, the authors make it clear that they are on a mission to debunk the obesity paradox theory. In other words, they assume that being overweight or obese is itself unhealthy (i.e., dogma 2), which is precisely the question up for discussion in the obesity paradox debate. Rigorously evaluating a claim (e.g., the obesity paradox)

²² One of Flegal's harshest critics, Walter Willett, was quoted saying this in response to research suggesting that "it's better to be overweight" (Raeburn, 2007). He said that about every 10 years this kind of research makes a comeback and "we have to stomp it out" (Ibid.).

This is of course an extreme example of how resistant some researchers can be to evidence that challenges the medical model. I am not at all suggesting that all, or even most, obesity researchers are thus resistant. However, it is interesting how "surprisingly effective" the "small number of vocal critics...[were] in raising considerable doubt" about Flegal and her colleagues' work (Flegal, 2021, p. 78).

is not a problem, but their fear that obesity paradox research may discourage people from trying to lose or maintain body mass influenced the way they collect and interpret data. Second, to defend their hypothesis that the obesity paradox would not exist if studies had accounted for confounding variables, the authors rely on a study (McAuley et al., 2010) whose sample group is far too homogeneous to generalize to the U.S. population. And lastly, the authors say that had studies suggesting the existence of the obesity paradox adjusted for other confounding factors (e.g., excessive alcohol use, illicit drug use, or AIDS), the effect would have been “blunted,” though they fail to consider how adjusting for other confounding variables (e.g., weight stigma or yo-yo dieting) could provide more evidence *for* the existence of the obesity paradox.

In the introduction of their paper, Ades and Savage explain how the obesity paradox “seems relatively easy to refute or explain given that weight loss and physical frailty are often a final common pathway to mortality” (2010, p. 112), and they later explain how they’ve been motivated to write this piece because the theory of an obesity paradox sends a “dangerous message” (113). This perspective is imbued with normative beliefs about obesity and assumes the nonexistence of the very phenomenon that is up for debate. To dismiss the existence of the obesity paradox, the authors say the effect is “blunted” when adjusting for cardiorespiratory fitness.

Ades and Savage (2010) cite McAuley et al. (2010) to defend this point. However, one of self-reported limitations of McAuley et al. (2010) is what has been called the “veteran effect.” This means that the sample group, consisting entirely of veterans, doesn’t adequately represent the population because these individuals (1) had to meet particular height and weight requirements, (2) could not have or develop any health complications (e.g., asthma, heart or vascular defects), (3) were required to maintain a particular level of fitness throughout their enlistment, and (4) were all male (McAuley et al., 2010). Additionally, the sample group consisted entirely of middle-aged men.

Using this kind of sample group undermines researchers’ ability to generalize the results, which is precisely what Ades and Savage (2010) try to use this data for. If the sample had included females, people of various sizes, levels of fitness, and age, and people who have various background medical conditions (i.e., if the sample actually represented the U.S. population), the estimated risk of obesity would be lower. Instead, the estimated risk of obesity in this study is only an appropriate estimate for individuals who have a similar history to male veterans. In their attempts to show that people in larger bodies are unhealthier than their normal-weight counterparts, Ades and Savage resort to using data that is not representative of the population without mentioning how this affects the strength of their argument.

Additionally, despite the fact that McAuley et al. and’s (2010, p. 120) study shows that “both high fitness and higher BMI independently reduced mortality risk,” Ades and Savage (2010) argue that because the effect is less prominent once the data is adjusted for cardiovascular fitness, this suggests that had the authors also adjusted for chronic lung disease, excessive alcohol intake, illicit drug use, AIDS, or other issues, “the obesity paradox may have further dissipated or disappeared” (114). In other words, it is assumed that if people of normal weight have higher mortality rates, then it must be because of some underlying and undefined medical condition (i.e., given dogmas 1 and 2).

Even though it may be the case that these confounding factors reduce the mortality rate of normal-weight people, there are confounding factors that could be adjusted to reduce the mortality rate among people in larger bodies as well, but these types of variables do not receive much attention. For example, epidemiological studies on the mortality risk associated with overweight and obesity often fail to take into consideration confounding factors such as family history of various illnesses, personal history of abuse, or the presence of mental illnesses (Cortese et al., 2016; Gard & Wright, 2005; Gay, 2017; Khazan, 2015; Lavie, 2014; Laymon, 2018). Evidence shows that weight stigma—and stress generally (Tomiyama, 2014; Tomiyama & Mann, 2013)—as well as lack of healthcare coverage (Lavie, 2014) are independent risk factors for various negative health outcomes regardless of body size (Vadiveloo & Mattei, 2017). Additionally, multiple attempts to lose weight, or “yo-yo dieting,” may increase one’s risk for cardiovascular disease, and impair one’s self-confidence and emotional well-being (Brownell & Rodin, 1994; Brownell et al., 1986). In other words, whether and what confounding variables are accounted for appears dependent on whether they support the medical model or not. I.

The selective attention of obesity researchers to certain confounding factors and the overly critical reactions to Flegal’s research illustrate how the social repercussions of research that challenges the medical model has influenced obesity research design in ways that support the medical model. Obesity researchers are worried that public health will deteriorate if such research gets uptake and cause public confusion which would thus undermine the confidence people have in science (Ades & Savage, 2010; Flegal, 2021). It is assumed that if obesity is more harmful than what is conveyed in, for example, research supporting the obesity paradox, the risk associated with this error would outweigh the risks generated from overly stringent public health and medical recommendations (Douglas, 2000). These kinds of risk assessments understand the possible detrimental effects associated obesity to exceed those related to weight stigma, weight-loss medications, dieting, etc. As a result, many believe evidence suggesting that obesity may not be as unhealthy as we had once thought is irresponsible and possibly even immoral given the dominant conception of obesity.

Obesity researchers are inattentive to how non-epistemic values influence how they weigh certain epistemic values (e.g., consistency or simplicity) over others (e.g., accuracy or breadth) and how they even understand “accuracy.” This is particularly concerning given how these non-epistemic values make way for research designs that further entrench the assumptions of the medical model. This approach to obesity research impedes epistemic efforts to better understand the nature of obesity and is not democratically informed by the values of stakeholders. In what follows, I provide a potential strategy for breaking out of this cycle of self-vindication generated by the medical model.

5 An alternative approach toward democratically endorsed aims

I’m not actually particularly that interested in [health] and God I hate science...but I recognized very early on that if [fat activists] are ever to succeed, we have to get a foothold in the medical world and make them understand. And

that's what I've tried to do because, when it comes down to it, the last argument is, 'oh but it's so unhealthy for you...' People get to discriminate against us because they're just trying to help us with our health.

– Lynn McAfee²³

I have argued that the medical model was illegitimately established and maintained in ways that conflict with the aims of obesity research. By relying on illegitimately established medical model dogmas to justify methodological choices, obesity researchers are impeding their epistemic endeavors to generate accurate beliefs about the biological processes happening in the body, specifically as it relates to the accumulation of adipose tissue. Additionally, given other evidence—for example, about how difficult it is for people to intentionally lose weight and the harms of weight stigma—these methodological choices are also not helping researchers achieve their social aim of improving health. The problem is not that obesity research relies on values; the problem is that it sometimes relies on the wrong kinds of values—values that are mistakenly said to be in the interest of health.

Given the social aim of improving health, obesity researchers working to achieve their epistemic aims to understand the complexities of fatness ought to incorporate social, ethical, and political values that better promote this democratically endorsed social aim (Intemann, 2015). To do so, they need to take into account and weigh more heavily the epistemic and non-epistemic values of stakeholders and restrict the influences of weight-loss and pharmaceutical industries. Given the great economic and political power of the weight-loss and pharmaceutical industries, their interests should count less than the interests of those who are less well off (Brown, 2020). The resulting research would explicitly acknowledge its value judgments about which types of models, methodological approaches, conceptual frameworks, or strategies for dealing with uncertainties that best promote stakeholders' interests.

An adverse outcome of obesity research and policy today is that it has lost the trust of many people—for example, fat justice scholars as well as various kinds of healthcare providers, researchers, therapists, and dietitians who support a weight inclusive and intuitive eating approach to health, but most importantly, key stakeholders. The distrust has transpired because researchers have failed to promote democratically endorsed aims by failing to acknowledge or take seriously dissenting voices, which predominantly come from fat activists. Given the political stance that fat activists take, and their disapproval of the way medicine has pathologized their political identity and has been used to justify their oppression, many fat activists want nothing to do with obesity research.

The best way to promote stakeholders' values and foster a more trusting relationship is through participatory research (PR) (Vaughn & Jacquez, 2020). There are many different types of PR approaches that can be pursued depending on the research topic. Obesity research could benefit from utilizing various PR approaches such as community-based participatory research (Leung et al., 2004), popular epidemiology (Brown, 1992), participatory health research (ICPHR, 2013), and emancipatory research (Zarb, 1992). The main takeaway from these approaches is that for research

²³ See Shanewood (1999).

to achieve its social aims, open dialogue and collaboration between researchers and stakeholders is needed throughout the research process.

Though collaboration exists throughout the research process, there are still questions of to what degree and how stakeholders will be involved. The answer to these questions depends on the PR approach that is chosen. The role of stakeholders in PR methodologies can range anywhere from simply providing qualitative data to researchers about their lived experiences to controlling the research project.²⁴ Stakeholders can be involved in identifying research questions, collecting data, data analyses, and the application of the findings. Involving stakeholders in these processes has shown to be helpful for researchers by, for example, identifying faulty data collection methods and identifying different ways of interpreting the data (e.g., see Brown, 1992; Leung et al., 2004). Certain PR approaches like, for example, popular epidemiology may be considered too demanding of researchers, but it raises important questions about the kinds of values epidemiologists should prioritize.

Much epidemiology research on obesity has sought to answer research questions with generalizable findings; however, because the data is often not diverse enough (and in many cases, purposely so), it cannot be generalizable in socially significant or pragmatic ways. Moreover, much obesity research fails to account for social determinants of health and their effect on weight (Javed et al. 2022) because disease can be more easily attributed to individual lifestyles devoid of social context. However, even social epidemiological research, which is specifically designed to understand the social production of health and illness, has failed to translate the research into action because it is inaccessible and irrelevant to the communities being studied (Leung et al., 2004; Petteway et al., 2019; Smylie et al., 2012). In response to this shortcoming, some researchers have opted for what is called *popular epidemiology* (also called *A People's Social Epidemiology*—see Petteway et al., 2019). Popular epidemiology is distinct from other kinds of epidemiology in that it is returning to “the roots of epidemiological inquiry by recognizing social factors as part of the disease causal chain *through a participatory process*” (Leung et al., 2004, 502, emphasis added). It is believed that epidemiology is losing sight of its value to promote public health, and the best way to do this is to learn from, empower, and build relationships with the participants.

Biomedical research participants value research that can improve their personal well-being, which is not (or should not be) at odds with the values of epidemiologists. Researchers using participants to gain generalizable information on how, for example, obesity can be treated is not *in itself* very helpful for the participants. Popular epidemiologists are less interested in generalizable information and more interested in generating knowledge that is most beneficial to the participants they are researching. Of course, for the information to be most beneficial for the participants, researchers must explore research questions that are at least in part determined by the participants themselves. Accessible and useful data also must be disseminated into the community

²⁴ French and Swain (1997), for instance, understand the aim of participatory research to be exploring and disseminating the views, feelings and experiences of research participants and ensuring that researchers are “accountable to” the participants (27). In contrast, emancipatory research aims “to change social relations of research production” in such a way that participants are in control of decision-making processes that shape their lives (28).

to ensure that timely and relevant social action can take place and that researchers do not disproportionately benefit from the products of the research. The potential benefits of involving stakeholders, however, will be curbed if the values, interests, and perspectives of certain members of a group are ignored.

Thus, a more fundamental question regarding the implementation of PR methodologies in obesity research is, which members of the stakeholder community should be involved? If certain members of the stakeholder community are excluded, the research may still run the risk of impeding democratically endorsed aims. Consider, for example, some recent attempts to incorporate “patients living with obesity” in research and dissemination (e.g., the European Coalition of People Living With Obesity).²⁵ While this is certainly a step in the right direction—because the voices of stakeholders are potentially having some impact on obesity research—the problem is that these groups do not represent a diverse set of experiences and perspectives on what it is like to live in a larger body. Instead, they consist of bariatric patients who appear to endorse the medical model given that their primary job is to educate people who live with and are affected by obesity and their campaigns are often heavily sponsored by weight-loss and pharmaceutical companies (ECPO, n.d.).²⁶ It is not enough to include people in larger bodies who have similar interests and values. For a scientific community to reap the epistemic benefits that come from participatory and emancipatory research, the community must engage in critical reflection and scrutiny to ensure that the research methods and background assumptions are justified and promote democratically endorsed aims. The experience and perspectives of fat activists give them the ability to notice and challenge presumptions, consider a larger range of hypotheses and explanations, and consider new areas of inquiry (Wylie, 2003; see also Douglas, 2005 and Intemann, 2015).

In addition to incorporating stakeholders, obesity research could also be improved by taking a more interdisciplinary approach. For instance, the inclusion of critical humanists in research teams could help shift the kinds of questions asked, the concepts used, and the interpretations of data made (Reardon et al., 2023). These research teams could consist of fat justice scholars and bioethicists who have already published work on the harms of weight stigma and current public health approaches to obesity (e.g., see contributors in Pausé & Taylor, 2021). In fact, many fat justice scholars are themselves stakeholders in obesity research, and in such cases, stakeholders who want to be members of the research team should be unquestionably accepted as such. Even when fat justice scholars are not stakeholders, they would more reliably be looking out for the interests of the stakeholders. Like feminist scholars who have pushed back against mainstream research models, studies, and findings designed by and based on men, “fat studies scholars [have] shown that the experiences of fat individuals do not mirror what studies in dominant obesity paradigms suggest they should be” (Brown, 2016).

Though most people generally accept that weight discrimination and fat-shaming are wrong, the idea that people in larger bodies can live enjoyable and fulfilling lives

²⁵ See <https://euroobesity.org>; I thank an anonymous reviewer for mentioning this example and encouraging me to elaborate on it.

²⁶ See <https://euroobesity.org/about/partners/>.

directly challenges the bias in favor of the medical model.²⁷ The inclusion of fat activists in research may sound like something that could jeopardize the integrity of science, but they are simply stakeholders that, unlike many bariatric patients, have pride in their fat embodiment.²⁸ Utilizing PR methodologies would help incorporate marginalized voices which in turn, is likely to produce a more “vigorous and epistemically effective critical discourse” (Longino, 2002, p. 131). If the inclusion of such perspectives is achieved, a scientific community that reaches a consensus does so not as a result of economic or political power nor through the exclusion of other perspectives but rather, as “a result of critical dialogue in which all relevant perspectives are represented” and exposed to the broadest range of criticism (Ibid.). While there is more work to be done in ironing out details as to how to involve fat activists in obesity research, and in ways that preserve the epistemic integrity of scientific research, this helps to reduce the influence of the medical model. I do not believe that stakeholders’ involvement in research and the promotion of interdisciplinary research will alone dismantle the medical model, but it plays an important role in challenging the self-proclaimed aims of obesity researchers. Truly embracing democratically endorsed aims will allow obesity researchers to discover a wider range of research questions, evidence, and possibilities.

6 Concluding thoughts

This past February, the American Association of Pediatrics released its first comprehensive guidelines for evaluating and treating children and adolescents with obesity (Hampl et al., 2023). These guidelines advise doctors to consider referring children as young as two years old to “intensive health behavior and lifestyle treatment” programs if they are “overweight” or “obese” (Ibid., 5, 55). For “obese” children ages 12 and up, doctors are encouraged to prescribe weight-loss medications and to offer those over age 13 with “severe obesity” a referral to a bariatric surgery center. This highly interventionist approach to “childhood obesity” overlooks the ways that weight-based stigmatization, bullying, and discrimination affect the well-being of children (Mehl, 2023). Recommending that doctors follow these guidelines is particularly troubling given the considerable evidence suggesting that doctors are the most common source of weight stigma, a fact shown to have detrimental effects on patients’ health (e.g., see Puhl & Heuer, 2009). Additionally, these recommendations ignore the considerable evidence showing that healthcare interventions are often counterproductive: stigma counteracts a health care provider’s attempt to improve health *and* promotes weight

²⁷ In other words, obesity researchers have taken for granted something that fat activists think is far from obvious (Koskinen, forthcoming). This is very similar to the ways disability activists have directly challenged the dominant personal tragedy model of disability and impairment by expressing pride in their embodiment (Swain & French, 2000).

²⁸ Some may think incorporating fat activists is problematic because it has been wrongly argued that fat activists are encouraging unhealthy lifestyles and glorifying obesity (Dionne, 2019). This is not the message of the fat activist movement. Other pride movements have not been about encouraging people to be adopt their lifestyles. For example, the purpose of the LGBTQI+ movement is not to encourage people to be gay. Rather, the purpose of pride movements is to celebrate a marginalized identity in the face of societal stigma.

gain (Tomiyama et al., 2018), intentional long-term weight loss is rare (Puhl & Heuer, 2010), weight stigma is positively correlated with eating disorder symptoms (Puhl, 2011), and yo-yo dieting may increase one's risk for cardiovascular disease (Brownell & Rodin, 1994). Given these complexities, why is the approach to improving children's health focused on recommending diets, weight-loss medication, and surgery?

If *health* is really the goal, we need to reevaluate the values that have influenced obesity research and public health recommendations. Why is there so much backlash for alternative understandings of adipose tissue and its effects on the body when clearly our current approaches to combat the “obesity epidemic” have not reduced the prevalence of larger bodies? If these alternative understandings or approaches to “obesity” will improve people's health by, for example, reducing the prevalence of stigmatization and discrimination, then we owe it to the stakeholders—and especially, *children*—to pursue other research questions, evaluate data differently, and use different models.

Acknowledgements I would like to thank the participants at the 10th Annual Values in Medicine, Science, and Technology Conference (May 2022) for their questions and feedback on my presentation. I would also like to thank Carina Fourie, Amelia Wirts, and Conor Mayo-Wilson for their helpful feedback on earlier drafts of this paper. I am particularly grateful to Sara Goering, Paul Franco, and Rose Nozick for their detailed comments and lengthy discussions on earlier drafts.

References

- Ades, P. A., & Savage, P. D. (2010). In *Mayo Clinic Proceedings* (Vol. 85, No. 2, pp. 112–114).
- Alexandrova, A. (2017). *A philosophy for the science of well-being*. Oxford University Press.
- Allison, D. B., Fontaine, K. R., Manson, J. E., Stevens, J., & Van Itallie, T. B. (1999). Annual deaths attributable to obesity in the United States. *JAMA*, 282, 1530–1538.
- American Medical Association (AMA), Council on Scientific Affairs. (2012). Report of the Council on Science and Public Health: Is obesity a disease? (Resolution 115-A-12). <https://www.google.com/url?q=https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/public/about-ama/councils/Council%2520Reports/council-on-science-public-health/a13csaph3.pdf&sa=D&source=docs&ust=1650637055643888&usq=AOvVaw2cCebJMKw3AF3HAOighwC>
- American Medical Association (AMA), House of Delegates. (2013). Resolution 420 (A-13). Subject: Recognition of obesity as a disease. <https://media.npr.org/documents/2013/jun/ama-resolution-obesity.pdf>
- Anderson, E. (2004). Uses of value judgments in science: A general argument, with lessons from a case study of feminist research on divorce. *Hypatia*, 12(1), 1–24.
- Aronowitz, R. A. (2001). When do symptoms become a disease? *Annals of Internal Medicine*, 134(9, Part 2), 803–808. https://doi.org/10.7326/0003-4819-134-9_Part_2-200105011-00002
- Arterburn, D. E., Telem, D. A., Kushner, R. F., & Courcoulas, A. P. (2020). Benefits and Risks of Bariatric Surgery in Adults: A Review. *JAMA*, 324(9), 879–887. <https://doi.org/10.1001/jama.2020.12567>
- Bacon, L. (2010). *Health at every size: The surprising truth about your weight*. BenBella Books.
- Bacon, L., & Aphramor, L. (2011). Weight science: Evaluating the evidence for a paradigm shift. *Nutrition Journal*, 10(1), 9. <https://doi.org/10.1186/1475-2891-10-9>
- Bellizzi, J. A., & Hasty, R. W. (1998). Territory assignment decisions and supervising unethical selling behavior: The effects of obesity and gender as moderated by job-related factors. *Journal of Personal Selling & Sales Management*, 18(2), 35–49.
- Bender, R., Jöckel, K.-H., Trautner, C., Spraul, M., & Berger, M. (1999). Effect of age on excess mortality in obesity. *JAMA*, 281, 1498–1504.
- Berg, F. M. (1999). Health risks associated with weight loss and obesity treatment programs. *Journal of Social Issues*, 55(2), 277–297.
- Boorse, C. (1975). On the distinction between disease and illness. *Philosophy and Public Affairs*, 5(1), 49–68.
- Broadbent, A. (2009). Causation and models of disease in epidemiology. *Studies in History and Philosophy of Biological and Biomedical Sciences*, 40(4), 302–311.

- Brown, H. (2015). *Body of truth: How science, history, and culture drive our obsession with weight—and what we can do about it*. Da Capo Press.
- Brown, H. (2016). For research and practice. In E. Cameron & C. Russell (Eds.), *The fat pedagogy reader: Challenging weight-based oppression through critical education* (pp. 201–210). Peter Lang.
- Brown, M. J. (2020). *Science and moral imagination: A new ideal for values in science*. University of Pittsburgh Press.
- Brown, P. (1992). Popular epidemiology and toxic waste contamination: Lay and professional ways of knowing. *Journal of Health and Social Behavior*, 33(3), 267–281.
- Brownell, K. D., Greenwood, M. R. C., Stellar, E., & Eileen Shrager, E. (1986). The effects of repeated cycles of weight loss and regain in rats. *Physiology & Behavior*, 38(4), 459–464.
- Brownell, K. D., & Rodin, J. (1994). Medical, metabolic, and psychological effects of weight cycling. *Archives of Internal Medicine*, 154, 1325–1330.
- Campos, P. (2004). *The obesity myth: Why America's obsession with weight is hazardous to your health*. Penguin Group.
- CDC. (2022). Obesity Is a common, serious, and costly disease. Centers for Disease Control and Prevention. Retrieved July 20, 2022, from <https://www.cdc.gov/obesity/data/adult.html>
- CDC. (2023). Disability impacts all of us infographic | CDC. Centers for Disease Control and Prevention. Retrieved January 5, 2023, from <https://www.cdc.gov/ncbddd/disabilityandhealth/infographic-disability-impacts-all.html>
- Chastain, R. (2020). People first language is a problem, not a solution, for fat people. *Dances with fat*, January 27, 2020.
- Cooper, C. (2016). *Fat activism: A radical social movement*. HammerOn Press.
- Cortese, S., Moreira-Maia, C. R., St, D., Fleur, C.-P., Rohde, L. A., & Faraone, S. V. (2016). Association between ADHD and obesity: A systematic review and meta-analysis. *American Journal of Psychiatry*, 173(1), 34–43. <https://doi.org/10.1176/appi.ajp.2015.15020266>
- Crasnow, S. (2020). Feminist perspectives on science. *The Stanford Encyclopedia of Philosophy* (Winter 2020 Edition), E. N. Zalta (Ed.). <https://plato.stanford.edu/archives/win2020/entries/feminist-science/>
- Cypess, A. M. (2022). Reassessing human adipose tissue. *The New England Journal of Medicine*, 386, 768–779.
- Dionne, E. (2019). Here's What Fat Acceptance Is—and Isn't. YES!, June 24, 2019. <https://www.yesmagazine.org/social-justice/2019/06/24/fat-acceptance-movement/>.
- Dinour, L. M., Bergen, D., & Yeh, M.-C. (2007). The food insecurity–obesity paradox: A review of the literature and the role food stamps may play. *Journal of the American Dietetic Association*, 107(11), 1952–1961.
- Douglas, H. (2000). Inductive risk and values in science. *Philosophy of Science*, 67(4), 559–579.
- Douglas, H. (2005). Inserting the Public into Science. In S. Maasen & P. Weigart (Eds.), *Democratization of Expertise? Exploring Novel Forms of Scientific Advice in Political Decision-Making* (Vol. 24, pp. 153–169). Springer.
- ECPO. (n.d.). Partners. Eurobesity. Retrieved March 2, 2023, from <https://eurobesity.org/about/partners/>
- Ereshefsky, M. (2009). Defining 'Health' and 'Disease.' *Studies in the History and Philosophy of Biology and Biomedical Sciences*, 40, 221–227.
- Fauber, J., & Gabler, E. (2012). Doctors with links to drug companies influence treatment guidelines, *Milwaukee Journal Sentinel*. Retrieved February 21, 2022, from <https://archive.jsonline.com/news/health/doctors-with-links-to-drug-companies-influencetreatment-guidelines-ki7pjr6-184041791.html/>
- Flegal, K. (2021). The obesity wars and the education of a researcher: A personal account. *Progress in Cardiovascular Diseases*, 67, 75–79.
- Flegal, K. M., Graubard, B. I., & Williamson, D. F. (2004a). Methods of calculating deaths attributable to obesity. *American Journal of Epidemiology*, 160(4), 331–338. <https://doi.org/10.1093/aje/kwh222>
- Flegal, K. M., Williamson, D. F., Pamuk, E. R., & Rosenberg, H. M. (2004b). Estimating deaths attributable to obesity in the United States. *American Journal of Public Health*, 94(9), 1486–9.
- Flegal, K. M., Graubard, B. I., Williamson, D. F., & Gail, M. H. (2005). Excess Deaths Associated With Underweight. *Overweight, and Obesity*, *JAMA*, 293(15), 1861–1867.
- Flegal, K. M., Kit, B. K., Orpana, H., & Graubard, B. I. (2013). Association of All-Cause Mortality With Overweight and Obesity Using Standard Body Mass Index Categories: A Systematic Review and Meta-analysis. *JAMA*, 309(1), 71–82.

- Flum, D. R., Salem, L., Elrod, J. A. B., Patchen Dellinger, E., Cheadle, A., & Chan, L. (2005). Early mortality among Medicare beneficiaries undergoing bariatric surgical procedures. *JAMA*, *294*(15), 1903–1908.
- French, S., & Swain, J. (1997). Changing disability research: Participating and emancipatory research with disabled people. *Physiotherapy*, *83*(1), 26–32.
- Fuller, J., Broadbent, A., & Flores, L. J. (2015). Prediction in epidemiology and medicine. *Studies in History and Philosophy of Biological and Biomedical Sciences*, *54*, 45–48.
- Gard, M., & Wright, J. (2005). *The Obesity Epidemic: Science, Morality, and Ideology*. New York: Routledge.
- Garner, D. M., & Wooley, S. C. (1991). Obesity treatment: The high cost of false hope. *Journal of the American Dietetic Association*, *91*(1991), 1248–1251.
- Gardner, C. D., Kiazand, A., Alhassan, S., Kim, S., Stafford, R. S., Balise, R. R., Kraemer, H. C., & King, A. C. (2007). Comparison of the Atkins, Zone, Ornish, and LEARN Diets for Change in Weight and Related Risk Factors Among Overweight Premenopausal Women: The A TO Z Weight Loss Study: A Randomized Trial. *JAMA*, *297*(9), 969–77. <https://doi.org/10.1001/jama.297.9.969>
- Gay, R. (2017). *Hunger: A memoir of (my) body*. HarperCollins Publisher.
- Giel, K. E., Thiel, A., Teufel, M., Mayer, J., & Zipfel, S. (2010). Weight bias in work settings—a qualitative review. *Obesity Facts*, *3*(1), 33–40. <https://doi.org/10.1159/000276992>
- Glassman, S. (2022). Is BMI an accurate predictor of health? Here’s why it’s not always useful, according to experts. *Health Magazine*. Retrieved February 21, 2022.
- Gordon, A. (2020). *What we don’t talk about when we talk about fat*. Penguin Random House.
- Greenhalgh, S. (2015). *Fat-talk nation: The human costs of America’s war on fat*. Cornell University Press.
- Hainer, V., & Aldhoon-Hainerová, I. (2013). Obesity paradox does exist. *Diabetes Care*, *36*(2), S276–S281. <https://doi.org/10.2337/dcS13-2023>
- Hampf, S. E., Hassink, S. G., Skinner, A. C., Armstrong, S. C., Barlow, S. E., Bolling, C. F., Avila Edwards, K. C., et al. (2023). Clinical practice guideline for the evaluation and treatment of children and adolescents with obesity. *Pediatrics*, *151*(2), e2022060640. <https://doi.org/10.1542/peds.2022-060640>
- Han, S. J., & Boyko, E. J. (2018). The evidence for an obesity paradox in type 2 diabetes mellitus. *Diabetes & Metabolism Journal*, *42*(3), 179–187.
- Harrop, E. N. (2019). Typical-atypical interactions: One patient’s experience of weight bias in an inpatient eating disorder treatment setting. *Women & Therapy*, *42*(1–2), 45–58. <https://doi.org/10.1080/02703149.2018.1524068>
- Heiat, A., Vaccarino, V., & Krumholz, H. M. (2001). An evidence-based assessment of federal guidelines for overweight and obesity as they apply to elderly persons. *Archives of Internal Medicine*, *161*, 1194–1203.
- Heymfield, S. B., & Wadden, T. A. (2017). Mechanisms, pathophysiology, and management of obesity. *The New England Journal of Medicine*, *376*(3), 254–266. <https://doi.org/10.1056/NEJMra1514009>
- Howard, B. V., Manson, J. E., Stefanick, M. L., Beresford, S. A., Frank, G., Jones, B., Rodabough, R. J., Snetselaar, L., Thomson, C., Tinker, L., Vitolins, M., & Prentice, R. (2006). Low-fat dietary pattern and weight change over 7 years: The Women’s Health Initiative Dietary Modification Trial. *Journal of the American Medical Association*, *295*(1), 39–49.
- Ikeda, J., Amy, N. K., Ernsberger, P., Gaesser, G. A., Berg, F. M., Clark, C. A., Parham, E. S., & Peters, P. (2005). The national weight control registry: A critique. *Journal of Nutrition Education and Behavior*, *37*(4), 203–205.
- Intemann, K. (2015). Distinguishing between legitimate and illegitimate values in climate modeling. *European Journal of Philosophy of Science*, *5*, 217–232.
- Intemann, K. (2017). Feminism, values, and the bias paradox: why value management is not sufficient. In K. C. Elliott, & D. Steel (Eds.) *Values and science* (pp. 130–144).
- International Collaboration for Participatory Health Research (ICPHR). (2013). Position paper 1: What is participatory health research? http://www.icphr.org/uploads/2/0/3/9/20399575/icphr_position_paper_1_defintion_-_version_may_2013.pdf
- Johannes, L. (1997). Redux sales stop growing as dieters and insurers balk. *Wall Street Journal*, May 12, 1997.
- Jutel, A. (2017). Diagnostic categories. In M. Solomon, J. R. Simon, & H. Kincaid (Eds.), *The Routledge companion to philosophy of medicine* (pp. 156–169). Routledge.
- Kalantar-Zadeh, K., & Kopple, J. D. (2006). Obesity paradox in patients on maintenance dialysis. *Contributions to Nephrology*, *151*, 57–69.

- Kassierer, D., & Angell, M. (1998). Losing weight: An ill-fated new year's resolution. *NEJM*, 338(1), 52–54.
- Khazan, O. (2015). The second assault. *The Atlantic*, December 15, 2015. <https://www.theatlantic.com/health/archive/2015/12/sexual-abuse-victims-obesity/420186/>
- Kilov, D., & Kilov, G. (2018). Philosophical determinants of obesity as a disease. *Obesity Reviews*, 19, 41–48.
- Kolata, G. (1997). How Fen-Phen, A Diet 'Miracle,' Rose and Fell. *New York Times*, Retrieved February 22, 2022, from <https://www.nytimes.com/1997/09/23/science/how-fen-phen-a-diet-miracle-rose-and-fell.html>
- Koskinen, I. (Forthcoming). Participation and objectivity. *Philosophy of Science*. <https://doi.org/10.1017/psa.2022.77>
- Langreth, R. (1997). Critics claim drugs intended for obesity are often misused, *Wall Street Journal*, March 31, 1997. <https://www.wsj.com/articles/SB859758932791226500>
- Lavie, C. (2014). *The obesity paradox: When thinner means sicker and heavier means healthier*. Penguin Group.
- Lavie, C., Osman, A. F., Milani, R. V., & Mehra, M. R. (2003). Body composition and prognosis in chronic systolic heart failure: The obesity paradox. *American Journal of Cardiology*, 91(7), 891–894.
- Laymon, K. (2018). *Heavy: An American memoir*. Simon & Schuster.
- Leung, M. W., Yen, I. H., & Minkler, M. (2004). Community-based participatory research: A promising approach for increasing epidemiology's relevance in the 21st century. *International Journal of Epidemiology*, 33, 499–506. <https://doi.org/10.1093/ije/dyh010>
- le Roux, C. W., & Heneghan, H. M. (2018). Bariatric Surgery for Obesity. *Med Clin North Am*, 102(1), 165–182. <https://doi.org/10.1016/j.mcna.2017.08.011>
- Longino, H. E. (1990). *Science as social knowledge: Values and objectivity in scientific inquiry*. Princeton University Press.
- Longino, H. E. (2002). *The fate of knowledge*. Princeton University Press.
- Mann, T., Janet Tomiyama, A., Westling, E., Lew, A.-M., Samuels, B., & Chatman, J. (2007). Medicare's search for effective obesity treatments: Diets are not the answer. *American Psychologist*, 62, 220–233.
- McAuley, P. A., Kokkinos, P. F., Oliveira, R. B., Emerson, B. T., & Myers, J. N. (2010). Obesity paradox and cardiorespiratory fitness in 12,417 male veterans aged 40 to 70 years. *Mayo Clinic Proceedings*, 85(2), 115–121.
- Mehl, K. R. (2023). Is improving health really the goal? A criticism of the american academy of pediatrics guidelines for treating obesity. *Bioethics Today*, April 17, 2023.
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2004). Actual causes of death in the United States, 2000. *JAMA*, 291(10), 1238–1245.
- Mokdad, A. H., Marks, J. S., Stroup, D. F., & Gerberding, J. L. (2005). Correction: Actual causes of death in the United States, 2000. *JAMA*, 293(3), 298.
- Mokdad, A. H., Serdula, M. K., Dietz, W. H., Bowman, B. A., Marks, J. S., & Koplan, J. P. (1999). The spread of the obesity epidemic in the United States, 1991–1998. *JAMA*, 282(16), 1519–1522.
- Mundy, A. (2001). *Dispensing with the truth: The victims, the drug companies, and the dramatic story behind the battle over Fen-Phen*. St. Martin's Press.
- Nuttall, F. Q. Body mass index: Obesity, BMI and health: A critical review. In *Nutrition Today*, Retrieved April 7, 2015, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4890841/>
- Office of the Surgeon General (US); Office of Disease Prevention and Health Promotion (US); Centers for Disease Control and Prevention (US); National Institutes of Health (US). (2001). *The surgeon general's call to action to prevent and decrease overweight and obesity*. Rockville: Office of the Surgeon General (US). <https://www.ncbi.nlm.nih.gov/books/NBK44206/>
- Oliver, E. (2005). *Fat politics: The real story behind America's obesity epidemic*. Oxford University Press.
- Oliver, E. (2006). The politics of pathology: How obesity became an epidemic disease. *Perspectives in Biology and Medicine*, 49(4), 611–627.
- Oliver, M. (1996). *Understanding disability: From theory to practice*. Palgrave Macmillan.
- Pausé, C., & Taylor, S. R. (Eds.). (2021). *The Routledge international handbook of fat studies*. Routledge.
- Petteway, R., Mujahid, M., Allen, A., & Morello-Frosch, R. (2019). Towards a people's social epidemiology: Envisioning a more inclusive and equitable future for social epi research and practice in the 21st century. *International Journal of Environmental Research and Public Health*, 16(20), 3983. <https://doi.org/10.3390/ijerph16203983>

- Pollack, A. (2012). Prescription drug to aid weight loss wins F.D.A. backing, *New York Times*, Retrieved February 22, 2022. <https://www.nytimes.com/2012/06/28/health/diet-drug-gains-fda-endorsement.html>
- Pollack, A. (2013). A.M.A. recognizes obesity as a disease, *New York Times*, Retrieved February 22, 2022. <https://www.nytimes.com/2013/06/19/business/ama-recognizes-obesity-as-a-disease.html>
- Potochnik, A. (2015). The diverse aims of science. *Stud Hist Philos Sci*, 53, 71–80. <https://doi.org/10.1016/j.shpsa.2015.05.008>
- Puhl, R. (2011). Bias, stigma, and discrimination. In J. Cawley (Ed.) *The Oxford handbook of the social science of obesity* (pp. 553–571).
- Puhl, R. M., & Heuer, C. A. (2009). The stigma of obesity: A review and update. *Obesity*, 17, 941–964.
- Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: Important considerations for public health. *American Journal of Public Health*, 100(6), 1019–1028.
- Raeburn, P. (2007). Can fat be fit? *Scientific American*, September 1, 2007. <https://www.scientificamerican.com/article/can-fat-be-fit/>
- Rasmussen, N. (2019). *Fat in the fifties: America's first obesity crisis*. Johns Hopkins University Press.
- Reardon, J., Lee, S.-J., Goering, S., Fullerton, S. M., Cho, M. K., Panofsky, A., & Hammonds, E. M. (2023). Trustworthiness matters: Building equitable and ethical science. *Cell*, 186(5), 894–898. <https://doi.org/10.1016/j.cell.2023.01.008>
- Reiheld, A. (2015). With all due caution: Global anti-obesity campaigns and the individualization of responsibility. *The International Journal of Feminist Approaches to Bioethics*, 8(2), 226–249.
- Reznek, L. (1987). *The Nature of Disease*. New York: Routledge.
- Roehling, M. (2006). Weight-based discrimination in employment: Psychological and legal aspects. *Personnel Psychology*, 52, 969–1016. <https://doi.org/10.1111/j.1744-6570.1999.tb00186.x>
- Sabin, J. A., Marini, M., & Nosek, B. A. (2012). Implicit and explicit anti-fat bias among a large sample of medical doctors by BMI, race/ethnicity and gender. *PLoS ONE*, 7(11), 1–7. <https://doi.org/10.1371/journal.pone.0048448>
- Saguy, A. (2012). *What's wrong with fat?* Oxford University Press.
- Schwartz, M. B., Chambliss, H. O., Brownell, K. D., Blair, S. N., & Billington, C. (2003). Weight bias among health professionals specializing in obesity. *Obesity Research*, 11(9), 1033–1039. <https://doi.org/10.1038/oby.2003.142>
- Shanewood, B. (1999). An interview with medical rights champion Lynn McAfee. *Radiance* (Winter 1999). http://www.radiancemagazine.com/issues/1999/winter_99/truth.html
- Shermer, B. (1983). Intestinal bypass. In L. Shoenfielder & B. Wieser (Eds.), *Shadow on a tightrope: Writings by women on fat oppression* (pp. 157–161). Aunt Lute Book Company.
- Smylie, J., Lofters, A., Fireston, M., & O'Campo, P. (2012). Population-based data and community empowerment. In P. O'Campo & J. R. Dunn (Eds.), *Rethinking social epidemiology: Towards a science of change* (pp. 67–92). Springer.
- Spahlholz, J., Baer, N., König, H.-H., Riedel-Heller, S. G., & Luck-Sikorski, C. (2016). Obesity and discrimination—A systematic review and meta-analysis of observational studies. *Obesity Reviews*, 17(1), 43–55.
- Squires, S. (1998). Optimal weight threshold lowered: Millions more to be termed overweight. *The Washington Post*, p. A1.
- Strings, S. (2019). *Fearing the Black Body: The Racial Origins of Fat Phobia*. New York: New York University Press.
- Swain, J., & French, S. (2000). Towards an affirmation model of disability. *Disability & Society*, 15(4), 569–582.
- Tirosh, Y. (2012). The right to be fat. *Yale Journal of Health, Policy, Law, and Ethics*, 12(2), 264–335.
- Tomiya, A. J. (2014). Weight stigma is stressful: A review of evidence for the cyclic obesity/weight-based stigma model. *Appetite*, 82, 8–15.
- Tomiya, A. J., Carr, D., Granberg, E. M., Major, B., Robinson, E., Sutin, A. R., & Brewis, A. (2018). How and why weight stigma drives the obesity 'epidemic' and harms health. *BMC Medicine*, 16(123), 1–6.
- Tomiya, A. J., Hunger, J. M., Nguyen-Cuu, J., & Wells, C. (2016). Misclassification of cardiometabolic health when using body mass index categories in NHANES 2005–2012. *International Journal of Obesity*, 40, 883–886.
- Tomiya, A. J., & Mann, T. (2013). If shaming reduced obesity, there would be no fat people. *The Hastings Center Report*, 43(3), 4–5.

- Tomiyama, A. J., McClatchey, T. M., McCoy, S. K., Epel, E. S., Poelke, G., Kemeny, M. E., & Daubenmier, J. (2014). Associations of weight stigma with cortisol and oxidative stress independent of adiposity. *Health Psychology, 33*(8), 862–867.
- Troiano, R. P., Frongillo, S., Sobal, J., & Levitsky, D. A. (1996). The relationship between body weight and mortality: A quantitative analysis of combined information from existing studies. *International Journal of Obesity, 20*(1), 63–75.
- Vadveloo, M., & Mattei, J. (2017). Perceived weight discrimination and 10-year risk of allostatic load among US adults. *Annals of Behavioral Medicine, 51*(1), 94–104.
- Vanhove, A., & Gordon, R. A. (2014). Weight discrimination in the workplace: A meta-analytic examination of the relationship between weight and work-related outcomes. *Journal of Applied Social Psychology, 44*(1), 12–22. <https://doi.org/10.1111/jasp.12193>
- Vartanian, L. R. (2008). Effects of weight stigma on exercise motivation and behavior. *Journal of Health Psychology, 13*(1), 131–138.
- Vartanian, L. R. (2010). Disgust and perceived control in attitudes toward obese people. *International Journal of Obesity, 34*, 1302–1307.
- Vaughn, L. M., & Jacquez, F. (2020). Participatory research methods—choice points in the research process. *Journal of Participatory Research Methods, 1*(1), 1–13. <https://doi.org/10.35844/001c.13244>
- Waalder, H. T. (1984). Height, weight and mortality. The Norwegian experience. *Acta Med Scand Suppl., 679*, 1–56. <https://doi.org/10.1111/j.0954-6820.1984.tb12901.x #p>
- Wylie, A. (2003). Why standpoint matters. In R. Figueroa & S. Harding (Eds.), *Science and other cultures: Issues in philosophies of science and technology* (pp. 26–48). Routledge.
- Zarb, G. (1992). On the road to damascus: First steps towards changing the relations of disability research production. *Disability, Handicap and Society, 7*(2), 125–138.
- Zulqarnain, J., Valero-Elizondo, J., Maqsood, M. H., Mahajan, S., Taha, M. B., Patel, K. V., Sharma, G., Hagan, K., Blaha, M. J., Blankstein, R., Mossialos, E., Virani, S. S., Cainzos-Achirica, M., & Nasir, K. (2022). Social determinants of health and obesity: Findings from a national study of US adults. *Obesity, 30*(2), 491–502. <https://doi.org/10.1002/oby.23336>

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