

# Obesity as a Disease: A White Paper on Evidence and Arguments Commissioned by the Council of The Obesity Society

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*Obesity* (2008) **16**, 1161–1177. doi:10.1038/oby.2008.231

## EXECUTIVE SUMMARY

The Obesity Society (TOS) commissioned a panel of experts from among its members to undertake a review of the issue of labeling obesity a disease and to examine pertinent evidence and arguments. The panel unanimously and strongly stated that obesity is a complex condition with many causal contributors, including many factors that are largely beyond individuals' control; that obesity causes much suffering; that obesity causally contributes to ill health, functional impairment, reduced quality of life, serious disease, and greater mortality; that successful treatment, although difficult to achieve, produces many benefits; that obese persons are subject to enormous societal stigma and discrimination; and that obese persons deserve better.

Whether obesity should be declared a disease is controversial, and thoughtful arguments have been made on both sides of the issue. The panel recognized that there is a clear majority view among the general public as well as among authori-

tative bodies that it is reasonable to call obesity a disease. The panel reviewed three broad classes of argument as to whether obesity is rightly classified as a disease.

The first, the scientific approach, proceeds in two conceptually simple steps: i) identify the characteristics that entities must have to be considered diseases and ii) examine empirical evidence to determine whether obesity possesses those characteristics. The scientific approach would be well suited to answering the question "is obesity a disease?" rather than "should we consider obesity a disease?," were the former question answerable. However, after much deliberation, the panel concluded that the former question is ill posed and does not admit an answer. This is not because of a lack of agreement or understanding about obesity but rather because of a lack of a clear, specific, widely accepted, and scientifically applicable definition of "disease" that allows one to objectively and empirically determine whether specific conditions are diseases.

The second type of argument, the forensic approach, entailed looking to the public statements of authoritative bodies as evidence of whether obesity is a disease or should be considered a disease. A nearly exhaustive search for and consideration of the statements made by ostensibly authoritative bodies made apparent that there is a clear and strong majority leaning—although not complete consensus—toward obesity being a disease. However, although some authoritative bodies have offered statements that obesity is (or is not) a disease, very few of them have published a thorough and rigorous argument or evidential basis in support of the statement. Moreover, and far more importantly, the panel held that the opinions of authoritative bodies tell us—at most—what is lawful, consistent with mainstream opinions, or likely to be supported by others. Such opinions are insufficient to tell us what is true or what is right. The panel strongly endorsed the position that there can be no higher authority than reason. Hence, the forensic approach was judged to be inadequate to help us determine either whether obesity is a disease or whether it should be considered a disease.

The third approach to this question we termed the utilitarian approach. Recognizing that there is no clear agreed-on definition of disease with precise, assessable criteria that can be articulated, it seems that conditions that produce adverse health outcomes come to be considered diseases as the result of a social process when it is assessed to be beneficial to the greater good that they be so judged. Such judgments about likely benefit to the greater good are utilitarian judgments that may take empirical input but must also assume certain values. We considered the

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likely outcomes of considering obesity to be a disease to address the question “should obesity be declared a disease?” (as opposed to “is obesity a disease?”). Necessarily, our utilitarian analysis was speculative. The disease label tends to confer certain benefits, obligations, motivations, and legal considerations in our society.

The panel concluded that considering obesity a disease is likely to have far more positive than negative consequences and to benefit the greater good by soliciting more resources into prevention, treatment, and research of obesity; encouraging more high-quality caring professionals to view treating the obese patient as a vocation worthy of effort and respect; and reducing the stigma and discrimination heaped on many obese persons. The panel felt that this utilitarian analysis was a legitimate approach to addressing the topic, as well as the approach used for many other conditions labeled diseases, even if not explicitly so. Thus, although one cannot scientifically prove either that obesity is a disease or that it is not a disease, a utilitarian approach supports the position that obesity should be declared a disease.

#### OVERVIEW

The prevalence of obesity has been increasing for over a century (1) and has increased substantially in the past several decades (2). Clear and consistent evidence shows that obesity increases the risk of many morbidities and reduces both the quality and the quantity of life (3–5). These facts lead many to conclude that the time for concerted action to reduce levels of obesity and the deleterious effects of obesity is clearly upon us. In preparing for such action and in an attempt to enlist the participation and aid of broad sectors of society, many believe that labeling obesity a disease and having society accept this label is vital. However, is the label warranted? Prominent obesity experts have offered the opinion that it is indeed warranted, but equally prominent (although fewer) obesity experts have disagreed.

Similarly, writers in the mass media, advocates for obese persons’ rights and welfare, and members of the general public have also expressed strong opinions both for and against the appropri-

ateness of labeling obesity a disease. The National Consumers Union reported that in a national survey 78% of respondents somewhat or strongly agreed with the statement “obesity is a serious chronic disease” and 22% did not (6). Given this diversity of views, TOS commissioned a panel of experts from among its members to undertake a rigorous review of the issue of labeling obesity a disease and of the pertinent evidence and arguments. This report presents the results of that review.

#### THE QUESTION TO BE ADDRESSED

The formal question to be addressed is “should obesity be considered a disease?” This question is closely related to but fundamentally distinct from the question “is obesity a disease?” The panel concluded that the latter question—a seemingly empirical question that should (in principle) yield to scientific inquiry—is ill posed in that its sensibility is based on premises that are not true. It is therefore insensible and unanswerable. In contrast, “should obesity be considered a disease?” is a question that is fundamentally not empirical or scientific. Its reliance on the word “should” (read equally “ought”) immediately signals that it is a social, political, and fundamentally ethical and moral question (7), because what one should do depends not only on the likely effects of one’s actions (empirical input) but fundamentally on how one values various outcomes. Such values, although scientifically estimable, are not scientifically determinable. That is, although ethical and moral questions may be addressed in part by using scientifically generated empirical input (8), such questions should not be conflated with scientifically evaluable empirical questions that concern matters of fact rather than matters of value. Finally, there is substantial interest in many contexts as to whether obesity constitutes a disability (e.g., refs. 9, 10); to avoid any confusion, we note that this should be recognized as a distinct question that we are not addressing here.

#### Why are we addressing this?

As others have remarked (e.g., ref. 11) and as we elaborate below, whether obesity is considered a disease may have a profound impact on the lives of millions of obese

individuals as well as on multiple aspects of our society. We therefore believe that, as the leading professional obesity society in North America, TOS has the obligation to provide leadership on this issue. We hope that by providing an answer to the question of whether obesity should be considered a disease—an answer that is based on sound reasoning and represents the collective wisdom of this leading professional society—we may catalyze society at large to come to a consensus view on this point. In turn, we hope that reaching such a consensus may enable efforts to ameliorate the problems of obesity to move forward more effectively.

Our panel struggled with the complexity of the issues surrounding the question; the members held a diversity of views, as did the field of obesity researchers. Nevertheless, the panel’s members wish to note that there was absolutely no disagreement on the following fundamental points, which we voice loudly and clearly:

- Obesity is a complex condition with many causal contributors, including genetic ones and many environmental factors that are largely beyond individuals’ abilities to choose or control (12–15).
- Obesity causes much suffering.
- Obesity causally leads to many aspects of ill health (16), to functional impairment (17) and reduced quality of life (18), to serious disease (4), and to greater mortality (19). Successful treatment, although difficult to achieve, produces many benefits, including prevention of disease (20) and reduced mortality rate (21–23).
- Obese persons are subject to severe societal discrimination in ways that those with seemingly similar chronic conditions, such as hypertension, dyslipidemia, and diabetes, are not. For example, obese individuals are waited on more slowly by salespersons, less likely to be rented apartments, less likely to be offered jobs, even when as qualified as other applicants, and less likely to receive support for higher education from parents, and often are looked down on by educators and health professionals (24–26).

These points underpin our concern for obese individuals and provide the motivation for undertaking the charge of this panel.

### The process of developing this document

The Executive Committee of TOS wished to have a formal position statement on whether obesity is justifiably called and should be declared a disease and commissioned this white paper as a critical evaluation of relevant arguments and evidence. The panel, convened from among TOS's leaders and members, equally represented those who had previously expressed skepticism and those who had expressed belief that obesity is justifiably called a disease. The panel attempted to conduct an exhaustive search of the professional literature on this topic, discussed the various arguments that had been advanced, and agreed that the highest standards of intellectual rigor should be applied when considering the cogency of any position. Differences of opinion were discussed until consensus was reached in most cases. Some topics resisted consensus, and the panel members' divergent viewpoints are reflected in this document. The final draft was presented to TOS's council to be used as a basis of informed decision making about whether to offer a formal position statement on obesity as a disease and, if so, what that position should be.

### What is obesity?

We define obesity as an excess of body fat. It may be of either total body fat or a particular depot of body fat. The excess may even be in the morphology and function of body fat such that, for example, adipocytes, independent of total fat mass or fat mass distribution, are excessively enlarged. The adverse health consequences of accumulation of enlarged visceral or other adipocytes may tentatively be accounted for by enhanced secretion of most products of adipocytes that act as endocrine and paracrine factors on other cells, as well as the reduced production of adiponectin (27). Note that we do not define obesity as a BMI greater than or equal to 30 kg/m<sup>2</sup>. That is a useful operational definition (28) for many contexts but should not be used as the conceptual

definition. Even as an operational definition, a BMI greater than 30 may not be ideal, and authors are beginning to question whether the field should adopt a more useful operational definition (e.g., refs. 29, 30).

In our definition of obesity, excess of body fat denotes an amount sufficiently large to cause reduced health or longevity. This reduction in health will not be noticeable in all cases and may not be realized immediately, but obesity probabilistically threatens to reduce health in the future even if no health impairment is observed in an individual in the present. For example, as fat cells increase in size, they begin to produce substances (e.g., tumor necrosis factor- $\alpha$ ) in excess of normal levels. For some people this causes insulin resistance and diabetes, but for others who have sufficient adaptive capacity, no deterioration of body function or health is apparent. As with hypertension and elevated blood glucose, many people initially demonstrate no obvious health problem yet health deteriorates over time.

The effects of accumulation of adipose tissue depots and possibly of enlarged adipocytes appear to vary as a function of age, ethnicity, sex, and other factors. Hence, operational definitions of obesity may also need to vary as a function of these factors even if the conceptual definition remains constant.

### How might one approach the question "should obesity be considered a disease?"

To address the question of whether obesity should be considered a disease, we identified three major approaches that have been or could be used, approaches that go beyond rhetorical assertions. We term these the "scientific approach," the "forensic approach," and the "utilitarian approach." (Commonly used arguments that we believe to be patently invalid and worthy of only brief consideration are listed in Appendix 1.) The authors of most documents that attempt to address the issue of obesity as a disease have not described a thorough and organized argument or approach to reaching their conclusions. This does not necessarily mean that they did not use such an argument or

approach, only that none was described. Authors who have tried to be more thorough and rigorous in their analysis have generally used the scientific approach, the forensic approach, or both. In this document we argue that the scientific and forensic approaches are not useful in addressing this question and then move to the utilitarian approach, which, to our knowledge, has not been used as a primary approach. We argue that this is the most appropriate approach and use it to form the basis of our conclusion.

### HISTORICAL PERSPECTIVE

More than 2,500 years ago the physician Hippocrates, often called the father of medicine, recognized that people who were overweight were at higher risk for sudden death. Closer to our times, Malcolm Flemyng, a physician from the 18th century who wrote one of the two earliest books on overweight in the English language, stated that "corpulency" (i.e., obesity) can be a disease in some cases. **Table 1** lists historical quotations on obesity as a disease, from the 1600s to 1934. Inspection of these quotations makes clear that the idea that obesity may appropriately be called a disease is not new; it has recurred throughout the past several hundred years. Multiple authors (see, for example, refs. 31–33) said that obesity is appropriately considered a disease only when it reaches a certain degree of severity, implying that they conceived of obesity as a disease in some but clearly not all cases. Conversely, some authors (e.g., refs. 36, 38) said that obesity is not a disease in all cases, implying that it is in some. None of these authors provided a through discussion of why obesity should or should not be considered a disease. The primary form of "argument" used was simply *ipse dixit*, a rhetorical assertion without a valid supporting argument. This has been the most commonly used approach to this issue, even in the past 20 years, and remains the one in most frequent use.

### ARGUMENTS AND EVIDENCE: THE SCIENTIFIC APPROACH

#### Explication of the approach in general terms

The scientific approach is well suited to the question "is obesity a disease?"

**Table 1 Historical quotations on obesity as a disease, 1600s to 1934**

“Corpulency may be ranked amongst the diseases arising from original imperfections in the functions of some of the organs, yet it must be admitted also, to be most intimately connected with our habits of life.”

— Thomas Sydenham, 1624–1689 (quoted in ref. 31)

“Corpulency, when in an extraordinary degree, may be reckoned a disease, as it in some measure obstructs the free exercise of the animal functions; and hath a tendency to shorten life, by paving the way to dangerous distempers.”

— Malcolm Flemyng, 1760 (32)

“The only disease to be mentioned in this chapter, I have, with other nosologists, named Polysarda; and in English it maybe named Corpulency, or, more strictly Obesity... This corpulency or obesity, is in very different degrees in different persons, and is often considerable without being considered as a disease. There is, however, a certain degree of it, which will be generally allowed to be a disease; as, for example, when it renders persons, from a difficult respiration, uneasy in themselves, and, from the inability of exercise, unfit for discharging the duties of life to others: and for that reason I have given such a disease a place here.”

— W. Cullen, 1808 (33)

“Fat is, of all the humours or substances forming part of the human body, the most diffused; a certain proportion of it is indicative of health, and denotes being in good condition—nay, is even conducive to beauty; but when in excess—amounting to what may be termed OBESITY—it is not only in itself a disease, but may be the cause of many fatal effects, particularly in acute disorders.”

— W. Wadd, 1810 (34)

“Corpulency, when it arrives at a certain height, becomes an absolute disease.”

— Robert Thomas, 1811 (quoted in ref. 31)

“That many persons never become corpulent, no matter what they may eat, is undoubtedly true. These remarks are not for them but for those whose habits of living have produced that degree of obesity which if it does not render life a burden, begets in him who is afflicted with it (for it is almost a disease) a state extremely uncomfortable, sometimes painful, and always mortifying.”

— E. Price, 1867 (35)

“Obesity in man is often an infirmity, and sometimes a grave disease.”

— Anonymous, 1886 (36)

“The accumulation of fat in the tissues, or obesity, is a pathological or diseased condition.”

— Wood, 1893 (37)

“Obesity is not itself a disease in all instances.”

— W.G. Campbell, FDA chief, 1934 (quoted in ref. 38)

or, more abstractly and generically, to the question “does a class of entities A rightly belong as a subset of the larger class of entities denoted B?” Phrased in this more generic way, the way to proceed is obvious. It involves two conceptually simple steps. Step 1 is to identify the characteristics that entities must have to be considered members of class B. Step 2 is to examine empirical evidence to determine whether all entities in class A possess those characteristics. This is an approach taken by several authors (e.g., refs. 39–42), at least one legal proceeding (43), and a recent video, “Is Obesity a Disease?,” produced by the American Medical Association (AMA) (44) and offered on the website of the US Agency for Healthcare Research and Quality (45).

### Some key facts about obesity

Some key facts are germane in attempting to scientifically address the issue of obesity as a disease. In most cases, these facts are well known and well established and we do not dwell on the evidential basis. Instead, we simply state the fact and refer to an appropriate source for details of supporting evidence.

1. Obesity (or, more precisely, variations in BMI or body fat mass among individuals) has many causes both across and within individuals (12–14).
2. The prevalence of obesity has increased substantially in the past half century, both within the United States and globally. This increase has occurred in virtually every age, race, and sex group (46). A current

estimate is that roughly one-third of US adults (more than 50 million persons) are obese (46).

3. Obesity increases the risk of many morbidities (5,41,47) and reduces quality of life (18), functional capacity (17), and lifespan (19).
4. Animal model studies (48–50), studies of lifestyle intervention in humans (20), and studies of bariatric surgery in humans (21–23) all show that when weight and fat loss can be induced by medically recommended interventions among obese organisms, morbidities are reduced and lifespan can be increased.\*
5. Statement 3 applies in probability; that is, any obese individual may experience only minor adverse effects of obesity in any one or

\*That being said, it was also noted that data on obese persons who have lost substantial weight have been interpreted by some to indicate that fat loss also promotes homeostatic perturbations, e.g., reduced resting metabolic rate, decreased bone mineral density, and increased desire to eat. The interpretation of these data has been the subject of much discussion, and it is unclear whether the new levels achieved are abnormally low or normal given the individual's new body size. Moreover, the significance of such variations, if they are judged to be abnormalities, remains unclear. To some investigators, such a judgment leads to the conclusion that obesity might be the first disease in the history of medicine whose successful reversal might be detrimental for some components of body homeostasis, and it therefore makes the disease label for obesity seem more questionable. Other investigators, however, conclude that if obese individuals have an abnormal state even after weight reduction, this is *prima facie* evidence for the position that obese persons are not simply nonobese persons with extra adipose tissue but are physiologically different from nonobese persons at some fundamental or even inherent level. For these investigators, this interpretation strengthens the belief that obesity is a distinct disease entity.

more of these categories and may experience no adverse effects of obesity in some categories (39,41,51).

6. Apart from an expanded fat mass, which is inherent in the definition of obesity used herein and in a prior TOS (formerly NAASO) position statement (52), there is no characteristic sign or symptom that is present in all obese persons (39).

7. Obesity, at least when operationally defined as the exceeding of a specific amount of body fat or a specific BMI, is also associated with certain health benefits (53). These include the now rarely needed but obvious protection against starvation in times of food scarcity (54), protection against osteoporosis and fractures in the elderly (51), possible prevention of frailty in the elderly, reduced mortality rate in the elderly with mild obesity (55), and reduced mortality rate in certain severe illnesses or injuries (56). The extent to which these associations represent causation is not clear in all cases.

**Definitions of disease**

Kincaid (57) wrote, “There is a long-standing debate, inside medicine and out, about how to define disease and whether such definitions are value free.... The two predominant attempts at value-free notions of health are the biostatistical theory... and evolutionary functions approaches. The biostatistical theory holds that disease is deviation from species-typical functioning; disease is deviation from the average. In the evolutionary function view, disease occurs when an organ is not performing the job that allowed it to evolve via natural selection.”

Taking a somewhat different approach, Heshka and Allison (39) consulted multiple ordinary and medical dictionaries and extracted four points common to most definitions of disease:

- “(a) a condition of the body, its parts, organs, or systems, or an alteration thereof;
- (b) resulting from infection, parasites, nutritional, dietary, environmental, genetic, or other causes;

- (c) having a characteristic, identifiable, marked, group of symptoms or signs;
- (d) deviation from normal structure or function (variously described as abnormal structure or function; incorrect function; impairment of normal state; interruption, disturbance, cessation, disorder, derangement of bodily or organ functions).”

Taking a similar approach, the American Medical Association (44) offered the three points depicted in **Figure 1** and indicated that all three conditions need to be met to for obesity to be defined as a disease.

The US Food and Drug Administration (FDA) advanced a definition of disease based on an extensive, thoughtful process. Following enactment of the Dietary Supplements Health and Education Act (DSHEA) (58), the FDA had to establish a definition of disease. The manufacturers of dietary supplements would not be allowed to make statements that a dietary supplement product could be used to diagnose, treat, prevent, cure, or mitigate a disease but could make claims about the product’s effects on the structure or function of the body. The FDA process, which began in 1998, involved numerous public comments and a public hearing that involved senior FDA officials

and representatives of a broad cross-section of scientific, medical, industry, and advocacy organizations (59). At the end of the process, the agency decided to retain a definition issued in 1993 as part of the implementation of the Nutrition Labeling and Education Act (60), which defines disease as “damage to an organ, part, structure, or system of the body such that it does not function properly (e.g., cardiovascular disease), or a state of health leading to such dysfunctioning (e.g., hypertension); except that diseases resulting from essential nutrient deficiencies (e.g., scurvy, pellagra) are not included in this definition.” As indicated in Appendix 2, the FDA subsequently concluded that obesity is a disease by this definition (61).

Downey (40) and Conway and Rene (41) relied on a definition of disease found in *Stedman’s Medical Dictionary* that Downey described as a representative definition: “1. An interruption, cessation, or disorder of body functions, systems, or organs. Syn. Illness, morbus, sickness. 2. A morbid entity characterized usually by at least two of these criteria: recognized etiologic agent(s), identifiable group of signs and symptoms, or consistent anatomical alterations. See Also: syndrome. 3. Literally, dis-ease, the opposite of ease, when something is wrong with a bodily function.”

**Is Obesity a Disease?**

**Definition of "disease"**

- 1 Impairment of normal functioning of some aspect of the body
- 2 Characteristic signs or symptoms
- 3 Resultant harm or morbidity to the entity affected

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**Figure 1** A screen capture from the American Medical Association’s video “Is Obesity a Disease?” (44).

Consideration of the above definitions begins to make apparent some of the difficulties with this approach. Are the definitions equivalent? If not, whose definition should be considered paramount? Are the definitions precisely interpretable and applicable? Are they sensible on their face, likely to admit to the class of diseases all the entities that common parlance and societal consensus accept as diseases, and likely to reject from the class of diseases all the entities that common parlance and societal consensus would not accept as diseases?

#### What can we conclude if we take this approach strictly?

With respect to what Kincaid (57) terms the biostatistical theory, it would be difficult to argue that obesity constitutes a statistical rarity given that roughly one-third of the US adult population is obese. Moreover, even if we allowed that one-third was a sufficient minority for obesity to merit the disease appellation, such a decision process would invalidate that conclusion if obesity occurred in more than 50% of the population, as some authors have speculated it will (e.g., ref. 62). The decision to declassify a condition as a disease simply because too many people have it makes little sense.

In the evolutionary function approaches described by Kincaid (57), “disease occurs when an organ is not performing the job that allowed it to evolve via natural selection.” However, apparently not all would accept such a definition. For example, a document issued by the National Institutes of Health (NIH) said that irritable bowel disease is not a disease: “It’s a functional disorder, meaning that the bowel doesn’t work, or function, correctly” (63). According to the NIH, then, an organ that is not functioning correctly is not sufficient for the condition to be labeled a disease.

On this point, Temblay and Doucet (64) wrote, “Obesity facilitates the maintenance of body homeostasis probably because of an increased hormonal gradient which favours the regulation of energy balance, to give but one example. The regulation potential of excess body fat is particularly apparent in the reduced-obese state where a reduction of energy expenditure, fat oxidation and some immune system

markers, as well as an increase in appetite, stress vulnerability and circulating and adipose tissue organochlorines, have been observed. These constitute another category of risk factors which can certainly favour the accumulation of body fat to reestablish body homeostasis on other fronts. Under such conditions, obesity is perceived by the physiologist as a necessary biological adaptation rather than a disease.” In contrast, others argue that, although adiposity might be protective in some cases, this does not necessarily support the conclusion that obesity is therefore homeostatic or beneficial overall. Extra fat might protect against toxins or offer some beneficial effects yet simultaneously have deleterious effects that outweigh the benefits. Similarly, if there are mechanisms that promote fat deposition as a defense against environmental toxins, then those toxins might be seen as etiologic mechanisms for obesity. Homeostatic mechanisms are not always clinically good or desirable, especially in environments that are not closely aligned with those in which the species evolved.

A further line of argument along evolutionary lines considers that the key organ in obesity is adipose tissue and a purpose of adipose tissue is to store excess available energy as triglyceride for future use. When adipose hypertrophy occurs beyond some point and new adipocytes cannot be proliferated, adipose tissue may no longer effectively serve this function and metabolic aberrations may result (65). Although this may be true, it is not likely that that this is the sole or primary means by which obesity adversely affects health, function, and longevity. Finally, although storing triglyceride is one function of adipose tissue, it is certainly not the only function.

Thus, the evolutionary approach permits an interesting array of perspectives and does not offer a clear path by which obesity may be classified as a disease. De Vries (66) also considered these biostatistical and evolutionary definitions and came to the same conclusion that we do.

We now consider the approach of comparing the known facts about obesity to the dictionary-based definitions offered by Heshka and Allison (39), Conway and Rene (41), Downey (40), and the AMA

(44). Referring to their four key elements in common definitions of disease, Heshka and Allison wrote that there should be little disagreement that obesity satisfies the first two elements: an excess accumulation of fat can certainly be thought of as a condition of the body and the list of potential causes is so extensive that the causes of obesity must surely be found there. However, they expressed concerns about the third element because, as we offered above when discussing key facts about obesity, no signs inevitably characterize the condition of obesity other than excess adiposity, which is the definition of obesity. Similarly, the AMA (44) noted that obesity failed to satisfy what it listed as the second criterion of a disease: characteristic signs and symptoms (Figure 1). Specifically, the AMA stated, “Three criteria must be met.... The second criterion of disease, characteristics signs or symptoms, is not fully met by obesity. There are no specific symptoms of obesity and the only sign is a greater weight and an excessively large appearance.” The AMA explicitly states that obesity is not a disease. Given that the organization asserts that three criteria must be met, explicitly states that one of the three is not met, and strongly questions the third, the conclusion from its point of view is obvious. In contrast, Downey (40), referring to Stedman’s second definition of a disease—i.e., “*identifiable group of signs and symptoms*” (emphasis added)—wrote, “Obesity clearly meets all 3 criteria, not just 2.... The signs and symptoms of obesity include an excess accumulation of adipose tissue and are likely to include insulin resistance, increased glucose, elevated cholesterol and triglyceride levels, decreased levels of high-density lipoprotein and norepinephrine, and alterations in the activity of the sympathetic and parasympathetic nervous system.”

There are other differences between the definitions used by Heshka and Allison and the AMA and that used by Downey. Downey requires that two of three criteria be met, whereas Heshka and Allison and the AMA require all criteria to be met, an increase in the burden of proof. Heshka and Allison’s requirements seemed to be the proper distillation of the many definitions they reviewed. The reasons for the

AMA's choice are unknown to us, but we may speculate that they are similar. Additionally, only as implied by the language of their fourth criterion does the definition used by Heshka and Allison refer to resultant mortality or morbidity, whereas Downey's definition does so more explicitly. Curiously, Oliver (42) also relied on Stedman's definition but came to the conclusion opposite from that of Downey (40) and Conway and Rene (41). Oliver wrote, "Even *Stedman's Medical Dictionary* does not call obesity a disease, it is simply 'excess subcutaneous fat in proportion to lean body mass' or, at worst, 'a *public health* problem.'"

How is it that these authors disagree on the fundamental issue of whether obesity has an identifiable group of signs and symptoms, characteristic signs and symptoms, or a characteristic, identifiable, marked, group of symptoms or signs? Key issues seem to be the inclusion or interpretation of words such as "characteristic" and the eschewing or lack thereof of tautological reasoning.

Both Heshka and Allison (39) and the AMA (44) use the word "characteristic" and interpret it to imply a certain degree of inevitability. Thus, although there is no dispute that, as Downey (40) wrote, the adverse effects of obesity are "likely [emphasis added] to include insulin resistance, increased glucose," as Downey's use of the word "likely" implies and as stated earlier in the key facts about obesity, these are only likely outcomes of obesity, not inevitabilities. Some might question whether an entity must have characteristic signs to be considered a disease and note that tuberculosis, for example, is usually considered a disease and has characteristic signs of bloody cough and fever, yet this condition—sometimes referred to as "the great pretender"—can alternatively present as back pain, fever without respiratory symptoms, adrenal crisis, and headache, and in many other noncharacteristic ways. This example reinforces the notion that no existing definition of disease seems entirely satisfactory to capture entities generally accepted as disease and to exclude entities not accepted as diseases.

An example of tautological reasoning is the listing by Downey (40) of excess

accumulation of adipose tissue among the signs and symptoms of obesity. Heshka and Allison (39) see this as a trivial truth because it is part of the definition of obesity. To return to the abstract version of "does a class of entities A rightly belong as a subset to the larger class of entities denoted B?" if a criterion for membership in class B is having a characteristic sign and we admit that a sufficient characteristic sign is that an entity has been labeled as being in another particular class (e.g., class A), then all identifiable classes of entities will meet this criterion and it ceases to have any discriminating meaning and becomes superfluous. If we are to take seriously the idea that dictionaries are authoritative sources on definitions of disease, then we need to assume that these definitions are meaningful and therefore do not contain superfluous elements. Tautological interpretation that makes elements superfluous thereby vitiates the scientific approach to evaluating obesity as a disease.

We turn to the fourth criterion of Heshka and Allison (39) (i.e., deviating from normal structure or function) and the third criterion listed by the AMA (44) (resulting in harm or morbidity to the entity affected). Heshka and Allison wrote, "The deviations specified range from simple deviation from normality, to impairment, interruption or cessation of vital functions. Moreover, what is meant by deviation from normality is not clear—it can imply undesirable variation or simple statistical rarity." Tremblay and Doucet (64) make clear that it is not obvious that obesity can be uniformly described as an impairment in function, and, as we noted in the key facts about obesity, obesity is only associated with various adverse events and limitations in probability. The AMA (44) arrives at essentially the same conclusion. In contrast, the definition used by Downey (40) and Conway and Rene (41) does not require that such a criterion be met. According to this approach, for example, stroke might not be considered a disease or illness because it does not uniformly result in an impairment of function and its effects range from subclinical ones (normality) to massive impairment and death. This further reinforces the point that existing dictionary definitions

of disease seem ill suited to capturing entities that society clearly recognizes as disease (and also to excluding things clearly not recognized as diseases) and the subsequent conclusion that entities do not come to be classified or not classified as disease on the basis of comparing facts known about the entities with accepted defining criteria of diseases.

Thus, an analysis of attempted applications of the scientific approach to determining whether obesity is rightly labeled a disease reveals that differences in conclusions do not stem from disagreements about the facts regarding obesity but rather from whether those facts justify declaring obesity a disease on definitional grounds because of disagreement about the precise definition of "disease" and how that definition should be legitimately applied.

#### Is the question ill posed?

A question can be said to be ill posed if it is insensible and will be insensible if its sensibility depends on premises that are not true. Asking and answering the question "is obesity a disease?" is predicated on the premise that there is a clear concept of disease. As shown above, we do not struggle with answering this question because of disagreements about facts regarding obesity; we struggle because of a lack of clarity and consensus as to the definition of disease (57). The struggle is not solved by simply adopting the definitions and interpretive approach used by Downey (40) and Conway and Rene (41) on the one hand or by Heshka and Allison (39) and the AMA (44) on the other hand. Strict application of Downey's definition and approach would result in the labeling of any characteristic or habit that causes increased risk of morbidity or mortality as a disease, including being male, being over age 40, riding a motorcycle without a helmet, not sleeping 6–8 hours per day, and not regularly consuming moderate amounts of alcohol. All of these are associated with increased morbidity and/or mortality (i.e., are morbid entities), all have causes (i.e., etiologic agents), and all have characteristic signs (especially if one admits tautological identification of such signs), and the first two have characteristic anatomic alterations. Inclusion of

such entities in the category of diseases seems absurd. (In some of these examples the characteristic sign would simply be a behavior, but if one rules this out as a legitimate qualifier, then almost all forms of mental illness would not qualify as disease.) Similarly, strict application of the approach used by the AMA and Heshka and Allison might exclude many entities from the category of disease that society at large seems to have agreed to label as diseases, including hypertension, alcoholism, and many psychological disorders. This in no way implies that hypertension, alcoholism, and many psychological disorders should not be considered diseases but rather that available definitions of disease are wanting and do not in practice serve as the foundation for determining which entities come to be considered diseases.

The idea that disease is not a crisply defined category that admits strict scientific or empirical verification of an entity's eligibility for the category was nicely articulated by Richard Levinson, the associate executive director of the American Public Health Association. "During my lifespan," he noted, "the infectious disease of children were regarded as part of the normal process of growing up. We now regard them as totally avoidable and eminently preventable, and we consider, those of us who have been in public health, we consider it a stain on our escutcheon if a single child shows up in our jurisdiction with one of these illnesses. This was not true for centuries and eons. So this definition is highly fluid and we must be aware of it, and what is a natural state today may not be regarded as a natural state in the near future." He added, "I think that it is absolutely clear that there are not two categories in this world, disease and not disease, or disease and natural state. This is a continuity between the two, and... the boundaries are, at best, arbitrary" (59). This point is further reinforced by the FDA's exclusion of "diseases resulting from essential nutrient deficiencies" from its definition of disease for the purposes of enforcing DSHEA (67). By the agency's own language, some of the things it excludes from the category of disease are diseases, implying that the FDA considers that something may properly be labeled a disease in one context and not in another.

The fact that a single definition and its use cannot be agreed on and that adoption of initially seemingly reasonable definitions may lead to absurd outcomes if rigorously applied, suggests that as a community we do not have precise well-accepted definitions of disease that can be applied in a scientific manner to determine whether something is a disease. Hence, if there is no clear precise definition of disease, it makes no sense, from a strictly scientific point of view, to ask whether obesity is a disease.

### Conclusion

The scientific approach would be well suited to answering the question "is obesity a disease?" rather than "should we consider obesity a disease?" were the former question answerable. However, we believe the question is ill posed and does not admit an answer. This is not because of a lack of agreement or understanding about obesity but rather because of the lack of a clear, specific, widely accepted, and scientifically applicable definition of a disease.

### ARGUMENTS AND EVIDENCE: THE FORENSIC APPROACH

By a forensic approach, we mean looking to the public statements of authoritative bodies as evidence for the validity of a proposition. Some authors (e.g., ref. 40) and some legal proceedings (e.g., ref. 68) have relied heavily on the forensic approach to determine whether obesity is rightly considered a disease. Application of the approach involves two simple steps: identifying an authoritative body and determining its stated position on whether obesity is or should be considered a disease. Although these steps are conceptually simple, there are practical challenges and fundamental questions as to the worth of the forensic approach.

### The importance of distinguishing offhand statements from official declarations

In adopting the forensic approach, it is important to distinguish casual statements from official positions. For example, if the president of the United States were to state in a speech that despite the tribulations of today, the sun will rise

tomorrow, we would not take seriously a claim that this demonstrated that the federal government's official position is that the sun moves relative to the earth. So, too, if an excerpt from a book offered on the website of the American Diabetes Association (ADA) says, "Obesity is not a disease but a prominent risk factor for many diseases" (69), this should not be assumed to be the ADA's official position. On the other hand, some statements are clearly meant to be official positions; e.g., see the statement by the Centers for Medicare & Medicaid Services (CMS) in Appendix 2. These examples are exceptionally clear. In many other cases, however, the extent to which a statement is the opinion of a spokesperson, the opinion of the larger body, an official declaration of a position, or an offhand remark is ambiguous. Readers should consider this in weighing the quotations provided.

### A summary of what has been said by authoritative bodies

We summarize statements by authoritative bodies in Appendix 2. Many statements may be construed to imply that the organizations take the position that obesity is a disease. Sources of such statements include the National Academy of Sciences, the NIH, the FDA, the former US Surgeon General, the World Health Organization, the American Association for Clinical Endocrinology/American College of Endocrinology, the American Gastroenterological Association, and an expert committee convened by the Maternal and Child Health Bureau. At least one agency, the CMS, has made a formal statement that leaves little doubt that they take no formal position on the question. At least one advocacy group (the International Size Acceptance Association) has made a clear statement that it does not consider obesity a disease. At least two organizations (the AMA and the Belgian Health Care Knowledge Centre) have made multiple statements that are seemingly contradictory.

### Problems with the forensic approach

As addressed above, it is difficult to distinguish between offhand (or well-thought-out) statements by an employee or affiliate of an organization and the

organization's official position (if it has one). Determining which bodies are appropriately judged to be authoritative is challenging. We suspect that not everyone would agree that all the groups represented in Appendix 2 are indeed authoritative bodies, but how exactly do we make this distinction?

Apparently authoritative bodies may (and do) disagree with one another. How, then, do we reach a decision if we are basing a decision on the opinions of such bodies? If we were to weigh the number of bodies that offer the opinion that obesity is a disease against the number that maintain that obesity is not a disease, not only would we be engaging in the logical fallacy *argumentum ad numerum*, but we would likely be ignoring a plausibly potent form of selection bias. Specifically, just as post offices do not post least-wanted posters of people widely believed to be guilty of nothing, some members of our panel intuitively believe that medical, scientific, and academic agencies and experts do not typically take the time to write articles stating that certain entities are not diseases even if they believe that to be the case.

Relying on the opinions of authoritative bodies risks reifying the political status quo and potentially makes progress the slave to the courage and perspicacity (or lack thereof) of large and often bureaucratic organizations. Some authoritative bodies (e.g., the US Congress, the Supreme Court, and the United Nations) have not spoken at all on the subject. Should their silence be weighed? Most importantly, relying on the opinions of authoritative bodies that have the power to make laws is appropriate for determining which behaviors are lawful, but is it appropriate for determining which conclusions are reasonable? Clearly the answer must be "no." We can judge the reasonableness of a conclusion only by examining the reasoning supporting that conclusion regardless of who offered the opinion. In this regard, it is noteworthy that none of the statements listed in Appendix 2 was accompanied by thorough and rigorous explication—if any explication at all—of the reasoning underlying the statements.

### Conclusion

First, consideration of the statements in Appendix 2 makes apparent that there is a lack of consensus among bodies that some might consider authoritative as to whether obesity is rightly called a disease, although there is a clear and strong majority leaning in this direction. Second, and far more important, the opinions of authoritative bodies tell us, at most, what is lawful, consistent with mainstream opinions, or likely to be supported by others. Such opinions, even if clear and consistent, are insufficient to tell us what is true or what is right. Our panel strongly endorsed the position that there can be no higher authority than reason. Hence, the forensic approach cannot help us determine whether obesity is a disease or whether obesity should be considered a disease.

### ARGUMENTS AND EVIDENCE: THE UTILITARIAN APPROACH

Given that no clear agreed-on definition of disease that has precise and assessable criteria can be articulated, how are things judged to be diseases? It seems that conditions that produce adverse health outcomes come to be considered diseases as the result of a social process when it is assessed to be beneficial to the greater good that they be so judged. Such decisions about likely benefit to the greater good are utilitarian judgments that may take empirical input but must also assume certain values. We examine the likely outcomes of considering obesity a disease and try to make clear the empirical input and value judgments being made. Necessarily, our comments concerning future effects must be speculative, and we offer them with humility as to our ability to forecast the future. In this light we are mindful of the principle of medicine that, if one can do nothing else, one should at least do no harm. We note also that the utilitarian argument in favor of labeling obesity a disease is not that this benefits some small special-interest group such as obesity researchers or treatment providers. Rather, the argument is that the disease label might have broad effects for a large portion of society, for the greater good.

Finally, we note that the utilitarian argument should not be confused with the argument from consequences, which

is a fallacious argument for the truth of a proposition on the basis that belief in the truth of the proposition has benefits. In contrast, a utilitarian argument is not fallacious when it concerns the benefit of courses of action as opposed to the truth of propositions. For this reason the utilitarian argument can address the question "should obesity be declared a disease?" as opposed to "is obesity a disease?"

### Anticipated effects of labeling obesity a disease

**Effects on public understanding of obesity and social stigma.** The current understanding of obesity by the public at large consists mainly of two positions. One position equates obesity with poor character, lack of self-control, laziness, and gluttony. It views obesity as the result of an individual's choice of behavior, like smoking or driving without a seatbelt, that has relatively little effect on others—a lifestyle choice. The other position sees obesity as a risk factor or a stage on the path to a real disease such as heart disease or diabetes. In this view, a reduction in obesity is seen as useful in reducing the risk of other diseases. However, reduction in body weight for its own sake is often associated with vanity or seen as a cosmetic issue. A third viewpoint is that obesity is a genetically determined trait (evidence clearly indicates that both genetic and environmental factors contribute to obesity), not very different from hair or eye color, and not a disease.

Viewing obesity as a disease may—depending on the breadth and depth of future public knowledge—affect these prevailing attitudes. The view of obesity as a lifestyle choice will be less widespread if the public begins to appreciate that it results from a combination of genetic predisposition, behavioral factors, and environmental influences, much like other diseases. By bringing the genetic and physiological influences more clearly into focus, the condemnation of individuals who cannot maintain a normal weight may be diminished. This may reduce the stigma and resulting discrimination experienced by persons with obesity.

On the other hand, labeling obesity a disease may further stigmatize some obese individuals who would now be marked

as having a disease whose existence is visually detectable. Although the panel members acknowledged the reasonableness of this conjecture, they felt that using the reasoning that elements of society will further discriminate against obese people if obesity is called a disease does not seem a good justification for refraining from categorizing obesity as a disease. As with other entities labeled diseases, one may be able to combat such unjust stigmatization and any attendant discrimination more effectively and aggressively once the disease label has been assigned openly. If society does declare that obesity is a disease, we are then obligated to ensure that it is treated as other diseases are and that those afflicted are afforded whatever protection the label can offer, without the stigma.

Those who view obesity as a lifestyle choice are concerned that its acceptance as a disease would be used as an excuse for individuals to stop trying to manage their weight and merely accept their weight as inevitable or immutable. However, the likelihood of this may be offset by the perception that obesity is a disease that results in premature death, sickness, and disability. One can conjecture that individuals who adopt this view would be expected to take their weight more seriously, cease engaging in dubious and episodic therapies, and take a more aggressive approach.

The other widely held public position—that obesity as a risk factor—is more problematic. This view is well supported by numerous association and observational studies and backed, in many but not all cases, by probable mechanisms of action. Although future studies may elucidate the relationships between obesity and its comorbid conditions, it appears clear that obesity is an independent risk factor for several fatal and disabling diseases. The difference that viewing obesity as a disease may make is one of emphasis. Risk factors, in addition to obesity, generally include age, gender, level of physical activity, smoking, and risk-taking behavior. The National Cancer Institute (70) defines a risk factor as “something that may increase the chance of developing a disease. Some examples of risk factors for cancer include age, a family history

of certain cancers, use of tobacco products, certain eating habits, obesity, lack of exercise, exposure to radiation or other cancer-causing agents, and certain genetic changes.” It should be noted that there is no inherent contradiction in something’s being both a disease and a risk factor. However, the resources of the US health-care system are directed less to risk factors than to the diseases such risk factors contribute to (unless one considers the risk factors as both risk factors and diseases, such as hypertension and diabetes, which get considerable attention). For this reason, diseases receive substantially more research funding than risk factors. Treatment of diseases is more often covered by health insurance than is the amelioration of risk factors. In other words, diseases are more in the mainstream of US health care than are risk factors. Risk factors are assigned to preventive health care, which historically receives fewer resources than disease treatment.

Because we care about the welfare and health of all people, including obese persons, we believe that additional resources to help ameliorate the suffering induced by obesity are desirable and we unabashedly make that view clear. This does not mean that resources should be expended without considering the safety and efficacy of the programs to which they are allocated, nor does it mean that they should be expended without considering other competing priorities, but only that the door should be opened to fair and serious consideration of such increases in resources for alleviating obesity.

**Effects on prevention programs.** Rising rates of childhood obesity continue to be a significant health and economic concern. To stem this increase will likely require early and sustained interventions that promote an active lifestyle and healthy eating. It seems likely that categorizing obesity as a disease would have a positive influence on such programs. It is even possible that it might give such programs greater urgency.

For employers, categorizing obesity as a disease might have positive or negative outcomes, depending on one’s point of view. If obesity were considered a disease, it is possible that employers would be required to offer obesity treatments,

including medications and surgical procedures, with the same cost-sharing arrangements that they offer for other services. Although this might allow lower-cost access to these procedures for obese individuals, it would ultimately increase costs for the employer. Some employers might respond by raising premiums or, as some small employers have done, dropping coverage altogether. It is also possible that employers would be increasingly hesitant to hire obese workers, who would now be more likely to take advantage of covered services. However, if obesity were declared a disease, it is possible that employers would be barred from discriminating on the basis of weight by the Americans with Disabilities Act. Currently there is little legislation that explicitly prohibits weight discrimination (10,71).

Another issue with declaring obesity a disease concerns the ability to use weight as a performance metric. For example, firms are increasingly offering financial incentives or reduced insurance premiums to individuals who move toward or maintain an ideal weight. There is evidence that these programs may be effective (72). However, if obesity were declared a disease, it might no longer be legal to tie incentives to measures of obesity, including weight or BMI. It is even possible that employers would face additional constraints on their ability to collect data on the body weight or BMI of employees, making these potentially beneficial programs even more challenging.

Depending on one’s point of view, declaring obesity a disease could mean protection of the privacy of individuals with obesity and a leveling of the playing field for obesity-related medical treatment or unnecessary inhibition of corporate wellness programs. On balance, the panel felt that the greater urgency conveyed by the disease label and the prevention programs that this might spur would substantially outweigh any detrimental effects on the implementation of such programs.

**Effects on treatment.** Categorization of obesity as a disease by the federal government and the medical establishment could have profound effects on treatment. In both the government and the medical establishment, obesity seems to be

underestimated as a condition meriting treatment and perhaps therefore is thought to be less entitled to the funding and consideration given to similar conditions that are more widely recognized as diseases. In general, the costs of medical obesity treatment and drugs for obesity are not covered by either government programs or private insurance companies. Many obese individuals are desperate for treatment—the number of people who self-treat and those treated by commercial programs is larger than the number currently treated by the medical establishment. If obesity were considered a disease and entitled to the same considerations given to other diseases, treatment paradigms would change fundamentally. Physicians and other health professionals currently have little incentive to treat obesity because the financial remuneration is lacking or insufficient, especially in light of the additional time and resources necessary for adequate treatment. If treatment were covered, more physicians would be likely to engage patients in treatment protocols. The FDA would come under more pressure to approve obesity drugs, and physicians would be more likely to use obesity drugs in treatment. Diseases are often viewed as alterations of normal biochemistry, and for many other diseases these alterations are treated with drugs (in addition to other measures) because drugs change biochemistry. There likely would be an increased attention to development of new and better obesity drugs by pharmaceutical companies but also a new willingness of physicians to try obesity drugs alone or in combinations, as is done for other diseases.

The FDA guidances for approval of obesity drugs might well be altered to give less importance to metabolic biomarkers (blood pressure, triglycerides, cholesterol) and more to the loss of adipose tissue itself or particular depots of adipose tissue that are especially noxious in excess. This would be based on the understanding that adipose tissue is not inert; it secretes many substances that travel through the bloodstream to various organs and tissues, such as leptin, resistin, adiponectin, sex hormones, angiotensin, tumor necrosis factor- $\alpha$ , and interleukin-6 (27,47,73,74). The hormones and other

substances secreted by adipose tissue are known to have profound, and usually deleterious, effects on many physiological functions.

Current medical education pays minimal attention to the problem of obesity, and even that is geared to the concept of obesity as a lifestyle choice rather than a physiological problem. If obesity were considered a disease, additional attention would need to be given to it and the attitudes of physicians would change. With this increased attention, medical treatment options, especially drug treatment, likely would become more aggressive. Medical treatment and obesity surgery would be given more attention by physicians, health administrators, insurance companies, and employers, resulting in greater access by patients to higher-quality care.

**Effects on insurance reimbursement.** In most health insurance plans, payments are made for the reasonable and necessary treatment of accidents or illnesses. Obesity has been viewed by the health insurance industry as a lifestyle issue or as a preventive health issue. In either case, there is little or no reimbursement of expenses for lifestyle counseling or preventive health care compared with that for diseases. Were obesity to be widely viewed as a disease, it is likely that insurers would feel greater pressure to remove the exclusion of obesity in their health-care plans. Not all obstacles to reimbursement would be removed; insurers would still question treatment effectiveness, there would still be limitations on coverage of pre-existing conditions, and employers might seek to raise contributions to health-care plans by employees who are overweight or obese. These issues would certainly need monitoring and involvement. However, it is difficult to see a negative effect in terms of health insurance reimbursement.

**Effects on medical education.** Medical education today is an example of the relatively short shrift given to preventive medicine in contrast to disease treatment. Lifestyle modification is rarely taught to medical students, whether it be for smoking, drug abuse, alcoholism, or obesity. Obesity itself is usually the subject of very limited, often optional presentations. Although attention to obesity in

medical school education appears to have increased somewhat in recent years, there is a strong belief that further increases are warranted (75,76). This belief contributes to the attitudes of some physicians that they are untrained in the treatment or prevention of obesity and lack the skills necessary to advise their overweight and obese patients. It is reasonable to speculate that if obesity were widely seen as a disease, it is likely that there would be an increase in the attention it receives as part of physician education and a consequent positive effect on patient care.

**Effects on consumer protection.** As mentioned above, the FDA has undertaken an extensive rule-making process regarding the definition of disease and whether obesity meets that definition for purposes of enforcing the DSHEA. Under current regulations, manufacturers of dietary supplements are barred from making claims that their products treat obesity because such claims are associated with disease. On the other hand, they can claim that a product causes weight loss or eliminates the risk of weight gain because such claims are structure/function claims. A position by TOS that obesity is a disease is unlikely to change this, with one caveat—although we have not herein defined obesity as a BMI of 30 or greater, the FDA has used this definition to distinguish obesity from overweight. This difference might be used to persuade the FDA to change its definition of obesity or to expand the current definition using a BMI with a lower cutoff. However, these outcomes are speculative. In summary, the FDA already treats obesity as a disease for purposes of the DSHEA, so this position statement is unlikely to change the status quo.

**Effects on discrimination prevention via legal means.** Labeling obesity a disease might enhance society's ability to use legal means to protect obese persons from unjust discrimination. However, the issues surrounding this are complex and vary from context to context (77). On balance, the panel did not feel it has sufficient information to draw a strong conclusion about the extent to which the disease label would enhance or encumber society's ability to use legal means to protect obese persons from unjust discrimination.

**Effects on credibility of obesity field and experts.** Bleich *et al.* (78) reinforce the intuitive notion that if obesity experts wish to be helpful to the general community, it will be important to build and retain the trust of that community. Therefore, we should consider the extent to which labeling obesity a disease will enhance or detract from the long-term credibility of obesity experts. Here there are likely to be both positive and negative effects.

On the negative side, every year several papers are published that might be termed deconstructionist obesity papers (for a recent example, see ref. 79). These are academic counterparts to the general public's occasional discomfort and distrust of the messages and messengers of the mainstream obesity research and treatment community. Deconstructionist obesity papers vary greatly, but two ideas espoused in many are that the ill effects of obesity have been exaggerated and that mainstream obesity experts offer the opinion that obesity is harmful and should be labeled a disease because they have financial conflicts of interest that motivate them to voice such opinions. One utilitarian consideration in choosing to label obesity a disease is that it may fuel this type of mistrustful thinking and thereby reduce the overall ability of obesity experts and clinicians to be helpful. Because of this, we believe it is important that obesity experts not cloak their utilitarian views on obesity as a disease as purely objective scientific determinations because doing so is disingenuous and likely to increase mistrust.

On the positive side, many clinicians are reluctant to become seriously involved in the treatment of obesity for fear of being seen as engaged in at best a trivial and at worst an unscrupulous medical practice. Were obesity ultimately accepted as a disease, it would likely do much in the long run to quell such fears and result in an increase in practitioners willing to engage in obesity treatment and in a greater trust of those practitioners.

In this area, the positive effects are likely to be greater and more long lasting than the negative effects. Thus, the net effect on the credibility of obesity experts and practitioners is likely to be positive in the long term.

### Limitations of the utilitarian approach

Although we believe that the utilitarian approach is the most sound approach to take to this issue, it is not without limitations that must be acknowledged.

#### Utilities can change over time.

Although an act may be judged to have largely positive utility, this may change as new information becomes available, values change with cultural shifts, or the environment changes. For example, homosexuality was once seen to be a disease, but it no longer is, because of changing utilities (80). Nevertheless, although utilities may change in the future, we must act on the utilities before us today, while leaving ourselves open to modifying our acts in the future.

**There is subjectivity in utilities.** There is no denying that there is subjectivity in values that in turn leads to subjectivity in utilities. We cannot prove, for example, that alleviating suffering is desirable, but we choose it as a value without apology. When we have chosen this and other values, the utilitarian analysis can proceed with reasonable objectivity.

**Actions will almost certainly have unforeseeable effects.** We tried to describe above the major effects that we anticipate labeling obesity a disease will have. However, we fully acknowledge that we cannot anticipate or delineate all effects, and some unforeseen effects will be positive and some will be negative. This implies to us that we need to monitor the results of our actions in the future, not that we should not take action in the absence of perfect (and therefore unattainable) knowledge.

### Conclusion

Necessarily, our utilitarian analysis is speculative. It is difficult to fully foresee complex effects over long periods of time. Because there are few data and precedents, we must enter these waters with humility about to our ability to forecast the future. On balance, though, it seems that considering obesity a disease is likely to have far more positive than negative consequences and benefit the greater good by soliciting more resources into research, prevention, and treatment of obesity; by encouraging more high-quality caring professionals to view treat-

ing the obese patient as a vocation worthy of effort and respect; and by reducing the stigma and discrimination heaped upon many obese persons.

### ACKNOWLEDGMENTS

We are grateful to Harold Kincaid for his thought-provoking discussion on this topic. This effort was supported by TOS's general operating budget.

(See Appendix 3 for documents relating to this topic that were reviewed but not cited in text.)

### DISCLOSURE

TOS and members of the writing group have accepted funds from multiple food, pharmaceutical, and other companies with interests in obesity.

### REFERENCES

- Helmchen LA, Henderson RM. Changes in the distribution of body mass index of white US men, 1890–2000. *Ann Hum Biol* 2004;31:174–181.
- Ogden CL, Carroll MD, Curtin LR *et al.* Prevalence of overweight and obesity in the United States, 1999–2004. *JAMA* 2006;295:1549–1555.
- Allison DB, Pi-Sunyer FX. Obesity treatment: examining the premises. *Endocr Pract* 1995;1:353–364.
- Klein S, Burke LE, Bray GA *et al.* Clinical implications of obesity with specific focus on cardiovascular disease—a statement for professionals from the American Heart Association Council on Nutrition, Physical Activity and Metabolism. *Circulation* 2004;110:2952–2967.
- National Heart, Lung, and Blood Institute. Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. The Evidence Report. NIH publication no. 98-4083 <[http://www.nhlbi.nih.gov/guidelines/obesity/ob\\_gdlns.pdf](http://www.nhlbi.nih.gov/guidelines/obesity/ob_gdlns.pdf)> (September 1998).
- Harris Interactive for National Consumers League. New Obesity Survey: Many Americans Think They're "Lighter" than They Are, Most NOT Being Told by a Doctor They Need to Lose Weight. Press release <[http://www.nclnet.org/news/2007/obesity\\_survey\\_06192007.htm](http://www.nclnet.org/news/2007/obesity_survey_06192007.htm)> (19 June 2007).
- Moore GE. *Principia Ethica* (1903). Transcription <<http://fair-use.org/g-e-moore/principia-ethica>>.
- Veach RM. Does ethics have an empirical basis? *Stud Hastings Cent* 1973;1:50–65.
- Moorman AM, Eickhoff-Shemek JM. The legal aspects—is obesity a disability under the ADA? *ACSM's Health Fitness J* 2005;9:29–31.
- Regan J, Hamer G, Wright A. The epidemic of obesity—when a disease is not a disability. *Tenn Med* 2003;96:564–565.
- Stein R. Is obesity a disease? *The Washington Post* 10 November 2003 <<http://www.washingtonpost.com/ac2/wp-dyn/A20220-2003Nov9>>.
- Keith SW, Redden DT, Katzmarzyk PT *et al.* Putative contributors to the secular increase in obesity: exploring the roads less traveled. *Int J*

- Obes (Lond)* 2006;30:1585–1594.
13. Bray GA, Champagne CM. Beyond energy balance: there is more to obesity than kilocalories. *J Am Diet Assoc* 2005;105 (5 Suppl 1):S17–23.
  14. Eisenmann JC. Insight into the causes of the recent secular trend in pediatric obesity: common sense does not always prevail for complex, multi-factorial phenotypes. *Prev Med* 2006;42:329–335.
  15. Astrup AV, Rossner S, Sorensen TI. [Alternative causes of obesity.] *Ugeskr Laeger* 2006;168:135–137. Article in Danish, abstract in English.
  16. Poirier P, Giles TD, Bray GA, et al. AHA Scientific Statement. Obesity and cardiovascular disease: pathophysiology, evaluation, and effect of weight loss. An update of the 1997 American Heart Association scientific statement on obesity and heart disease from the Obesity Committee of the Council on Nutrition, Physical Activity, and Metabolism. *Circulation* 2006;113:898–918.
  17. Jensen GL. Obesity and functional decline: epidemiology and geriatric consequences. *Clin Geriatr Med* 2005;21:677–687
  18. Fontaine KR, Barofsky I. Obesity and health-related quality of life. *Obes Rev* 2001;2:173–182.
  19. Fontaine KR, Redden DT, Wang C et al. Years of life lost due to obesity. *JAMA* 2003;289: 187–193.
  20. Knowler WC, Barrett-Connor E, Fowler SE et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 2002;346:393–403.
  21. Adams TD, Gress RE, Smith SC et al. Long-term mortality after gastric bypass surgery. *N Engl J Med* 2007;357:753–761.
  22. Bray GA. The missing link—lose weight, live longer. *N Engl J Med* 2007;357:818–820.
  23. Sjostrom L, Narbro K, Sjostrom CD et al. Effects of bariatric surgery on mortality in Swedish obese subjects. *N Engl J Med* 2007;357: 741–752.
  24. Yuker HE, Allison DB. Obesity: socio-cultural perspectives. In: Alexander LA, Lumsden DB (eds). *Understanding Eating Disorders*. Taylor & Francis: Washington, DC, 1994, pp. 243–270.
  25. Crandall CS. Prejudice against fat people: ideology and self-interest. *J Pers Soc Psychol* 1994;66:882–894.
  26. Crandall CS, Schifffhauer KL. Anti-fat prejudice: beliefs, values, and American culture. *Obes Res* 1998;6:458–460.
  27. Bray GA. Medical consequences of obesity. *J Clin Endocrinol Metab* 2004;89:2583–2589.
  28. Ennis RH. Operational definitions. *Am Educ Res J* 1964;1:183–201.
  29. Kragelund C, Omland T. A farewell to body-mass index? *Lancet* 2005;366: 1589–1591.
  30. Poirier P. Adiposity and cardiovascular disease: are we using the right definition of obesity? *Eur Heart J* 2007;28:2047–2048.
  31. Haslam D. Obesity: a medical history. *Obes Rev* 2007;8:31–36.
  32. Flemmyng M. *A Discourse on the Nature, Causes, and Cure of Compulency: Illustrated by a Remarkable Case*. Read before the Royal Society, London, November 1757. L. Davis and C. Reymers: London, 1760.
  33. Cullen W. *Practice of Physic*. Bell & Bradfute: Edinburgh, Scotland, 1808.
  34. Wadd W. Cursory Remarks on Compulency: By a Member of the Royal College of Surgeons. London: J. Callow, 1810.
  35. Price E. *The Science of Self Defence. A Treatise on Sparring and Wrestling*. New York: Dick & Fitzgerald: New York, 1867 <<http://www.geocities.com/cinaet/price.html>>.
  36. Origin of fat in animals. *Science* 1886;7: 444–446.
  37. Wood J. The relation of alimentation to some diseases. *Science* 1893;21:62–64.
  38. Sunstein CR. Is tobacco a drug? Administrative agencies as common law courts. *Duke Law J* 1998;47:1013–1069.
  39. Heshka S, Allison DB. Is obesity a disease? *Int J Obes Relat Metab Disord* 2001;25:1401–1404.
  40. Downey M. Obesity as a disease entity. *Am Heart J* 2001;142:1091–1094.
  41. Conway B, Rene A. Obesity as a disease: no lightweight matter. *Obes Rev* 2004;5:145–151.
  42. Oliver JE. The politics of pathology: how obesity became an epidemic disease. *Perspect Biol Med* 2006;49:611–627.
  43. Aetna Life Insurance Company v. Sanders. No. 47557. Court of Appeals of Georgia, 127 Ga. App. 352; 193 S.E.2d 173; 1972 Ga. App. LEXIS 884; 61 A.L.R.3d 816.
  44. American Medical Association. Is Obesity a Disease? Video presentation <<http://www.bigshouldersdubs.com/clients/ama/obesity02.htm>> (2007).
  45. US Agency for Healthcare Research and Quality. Quality Tools: Is Obesity a Disease? <[http://www.qualitytools.ahrq.gov/summary/summary.aspx?view\\_id=1&doc\\_id=10118&nbr=101605](http://www.qualitytools.ahrq.gov/summary/summary.aspx?view_id=1&doc_id=10118&nbr=101605)> (17 May 2007).
  46. Wang Y, Beydoun MA. The obesity epidemic in the United States—gender, age, socioeconomic, racial/ethnic, and geographic characteristics: a systematic review and meta-regression analysis. *Epidemiol Rev* 2007; 29:6–28.
  47. Bray GA. Obesity is a chronic, relapsing neurochemical disease. *Int J Obes Relat Metab Disord* 2004;28:34–38.
  48. Allison D, Muzumdar R, Einstein FH et al. Surgical removal of visceral fat improves metabolic profile and prolongs life in a manner similar to caloric restriction [abstr]. *Obesity* 2006;14:A28.
  49. Coffey CS, Gadbury GL, Fontaine KR et al. The effects of intentional weight loss as a latent variable problem. *Stat Med* 2005;24:941–954.
  50. Vasselli JR, Weindruch R, Heymsfield SB et al. Intentional weight loss reduces mortality rate in a rodent model of dietary obesity. *Obes Res* 2005;13:693–702.
  51. Karelis AD, Brochu M, Rabasa-Lhoret R. Can we identify metabolically healthy but obese individuals (MHO)? *Diabetes Metab* 2004;30:569–572.
  52. Villareal DT, Apovian CM, Kushner RF et al. Obesity in older adults: technical review and position statement of the American Society for Nutrition and NAASO, The Obesity Society. *Am J Clin Nutr* 2005;82:923–934.
  53. Faith MS, Allison DB. Obesity and physical health: looking for shades of gray. *Weight Control Digest* 1997;6:345–352.
  54. Eckel RH. Obesity: a disease or a physiologic adaptation for survival. In: Eckel RH (ed). *Obesity: Mechanisms and Clinical Management*. Lippincott, Williams and Wilkins: Philadelphia, 2003, pp. 3–30.
  55. Allison DB, Gallagher D, Heo M et al. Body mass index and all-cause mortality among people age 70 and over: the Longitudinal Study of Aging. *Int J Obes Relat Metab Disord* 1997;21:424–431.
  56. Habbu A, Lakkis NM, Dokainish H. The obesity paradox: fact or fiction? *Am J Cardiol* 2006;98:944–948.
  57. Kincaid H. Contextualist morals and science. In: Kincaid H, Dupre J, Wylie A (eds). *Value-free Science? Ideals and Illusions*. Oxford University Press: Oxford, UK, 2007, pp 218–238.
  58. Dietary Supplement Health and Education Act of 1994. Public Law 103-417. 103rd Congress <<http://www.fda.gov/opacom/laws/dshea.html>>.
  59. Food and Drug Administration. Transcript of Public Meeting on Regulations on Supplements Made for Dietary Supplements: Concerning the Effect of the Product on the Structure or Function of the Body <<http://www.fda.gov/ohrms/dockets/dockets/98n0044/tr00001.doc>> (4 August 1999).
  60. Food and Drug Administration. Guide to Nutrition Labeling and Education Act (NLEA) Requirements <[http://www.fda.gov/ora/inspect\\_ref/igs/nleatxt.html](http://www.fda.gov/ora/inspect_ref/igs/nleatxt.html)> (February 1995 revision).
  61. Food and Drug Administration. Regulations on Statements Made for Dietary Supplements Concerning the Effect of the Product on the Structure or Function of the Body; Final Rule. 21CFR101. *Fed Regist* 2000;65:999–1050 <<http://www.cfsan.fda.gov/~lrd/fr000106.html> (6 January 2000)>.
  62. Foreyt J, Goodrick K. The ultimate triumph of obesity. *Lancet* 1995;346:134–135.
  63. National Digestive Diseases Information Clearinghouse. What I Need to Know About Irritable Bowel Syndrome <[http://digestive.niddk.nih.gov/ddiseases/pubs/ibs\\_ez](http://digestive.niddk.nih.gov/ddiseases/pubs/ibs_ez)>. Accessed 28 October 2007.
  64. Tremblay A, Doucet E. Obesity: a disease or a biological adaptation? *Obes Rev* 2000;1:27–35.
  65. Danforth E Jr. Failure of adipocyte differentiation causes type II diabetes mellitus? *Nat Genet* 2000;26:13.
  66. De Vries J. The obesity epidemic: medical and ethical considerations. *Sci Eng Ethics* 2007;13:55–67.
  67. Food and Drug Administration. Health Claims: General Requirements. 21CFR114. Code of Federal Regulations Title 21 vol 2, pp. 62–65 <<http://www.cfsan.fda.gov/~lrd/fr000929.html>> (29 September 2000).
  68. Canadian Transportation Agency. Decision No. 646-AT-A-2001. 2001 <[http://www.cta-otc.gc.ca/rulings-decisions/decisions/2001/AT/646-AT-A-2001\\_e.html](http://www.cta-otc.gc.ca/rulings-decisions/decisions/2001/AT/646-AT-A-2001_e.html)> (12 December 2001).
  69. Adolffsson B, Arnold MS. Behavioral Approaches to Treating Obesity <[http://store.diabetes.org/media/PDFs/BehavioralApproaches\\_91df.pdf](http://store.diabetes.org/media/PDFs/BehavioralApproaches_91df.pdf)> (2006).
  70. National Cancer Institute. Dictionary of Cancer Terms <[http://www.cancer.gov/Templates/db\\_alpha.aspx?Cdrid=45873](http://www.cancer.gov/Templates/db_alpha.aspx?Cdrid=45873)>. Accessed 28 October 2007.
  71. Puhl R, Brownell KD. Bias, discrimination, and obesity. *Obes Res* 2001;9:788–805.
  72. Finkelstein EA, Linnan LA, Tate DF et al. A pilot study testing the effect of different levels

- of financial incentives on weight loss among overweight employees. *J Occup Environ Med* 2007;49:981–989.
73. Ahima RS. Adipose tissue as an endocrine organ. *Obesity* 2006;14:242S–249S.
  74. Trayhurn P. Adipocyte biology. *Obes Rev* 2007; 8(Suppl 1):41–44.
  75. Association of American Medical Colleges. Contemporary Issues in Medicine: The Prevention and Treatment of Overweight and Obesity Medical School Objectives Project <[https://services.aamc.org/Publications/showfile.cfm?file=version98.pdf&prd\\_id=205&prv\\_id=246&pdf\\_id=98](https://services.aamc.org/Publications/showfile.cfm?file=version98.pdf&prd_id=205&prv_id=246&pdf_id=98)> (August 2007).
  76. Banasiak M, Murr M. Medical school curricula do not address obesity as a disease. *Obes Surg* 2001;22: 677–679.
  77. Kirkland A. Representations of fatness and personhood: pro-fat advocacy and the limits and uses of law. *Representations* 2003;82:24–51.
  78. Bleich S, Blendon R, Adams A. Trust in scientific experts on obesity: implications for awareness and behavior change. *Obesity* 2007;15: 2145–2156.
  79. Monaghan LF. Body mass index, masculinities and moral worth: men's critical understandings of 'appropriate' weight-for-height. *Social Health Illn* 2007;29:584–609.
  80. Mendelson G. Homosexuality and psychiatric nosology. *Aust NZ J Psychiatry* 2003;37: 678–683.
  81. Thomas PR (ed). Committee to Develop Criteria for Evaluating the Outcomes of Approaches to Prevent and Treat Obesity, Institute of Medicine. *Weighing the Options: Criteria for Evaluating Weight-Management Programs*. National Academies Press: Washington, DC, 1995.
  82. Centers for Medicare & Medicaid Services. NCA Tracking Sheet for Obesity as an Illness (CAG-00108N) <<http://www.cms.hhs.gov/mcd/viewtrackingsheet.asp?id=57>>. Accessed 6 November 2007.
  83. NIH Consensus Development Program. Health Implications of Obesity <<http://consensus.nih.gov/1985/1985Obesity049html.htm>> (11–13 February 1985).
  84. World Health Organization. *Obesity: Preventing and Managing the Global Epidemic*. World Health Organization: Geneva, Switzerland, 1998.
  85. Downey M. AOA Provides Evidence to the IRS to Make Obesity Treatment a Medical Deduction <<http://obesity1.tempdomainname.com/subs/tax/irs97.shtml>> (17 March 2000).
  86. Partnership for Healthy Weight Management. Voluntary Guidelines for Providers of Weight Loss Products or Services <<http://www.ftc.gov/bcp/online/pubs/buspubs/wgtguide.pdf>> (February 1999).
  87. Dausch J. Determining when obesity is a disease. *J Am Diet Assoc* 2001;101:293.
  88. Barlow SE, Dietz WH. Obesity evaluation and treatment: expert committee recommendations. *Pediatrics* 1998;102:29.
  89. National Center for Health Statistics. The International Classification of Diseases (ICD-9-CM) <<http://www.cdc.gov/nchs/about/otheract/icd9/abctcd9.htm>>. Accessed 28 October 2007.
  90. World Health Organization. *ICD-10 Classification of Mental and Behavioural Disorders*. World Health Organization: Geneva, Switzerland, 1992.
  91. American Association of Clinical Endocrinology, American College of Endocrinology Position statement on the prevention, diagnosis, and treatment of obesity. *Endocr Pract* 1998;4: 297–350.
  92. Klein S, Wadden T, Sugerman HJ. AGA technical review on obesity. *Gastroenterology* 2002;123:882–932.
  93. *Professional Guide to Diseases*, 6th edn. Springhouse: Springhouse, PA, 1998.
  94. Veterans' Administration. Office of Research and Development Information Letter <[http://www1.va.gov/vhapublications/ViewPublication.asp?pub\\_ID=1337](http://www1.va.gov/vhapublications/ViewPublication.asp?pub_ID=1337)> (25 October 2005).
  95. FDA/NIH Joint Symposium on Diabetes. Targeting Safe and Effective Prevention and Treatment <<http://www3.niddk.nih.gov/fund/other/FDA-NIH/final.pdf>> (13–14 May 2004).
  96. American Academy of Family Physicians. Obesity. *FP Report* (Assembly Edition), 18 September 1998.
  97. American Society of Bariatric Physicians. Frequently Asked Questions <[http://www.asbp.org/siterun\\_data/faq/news.php?q=5405d8a903c83e89cb649f1b518ef1be](http://www.asbp.org/siterun_data/faq/news.php?q=5405d8a903c83e89cb649f1b518ef1be)>. Accessed 9 November 2007.
  98. American Obesity Association. Guidance for the treatment of adult obesity. Available at: <http://obesity1.tempdomainname.com/treatment/guide97.pdf> (accessed 30 October 2007).
  99. American Society of Health-System Pharmacists. ASHP therapeutic position statement on the safe use of pharmacotherapy for obesity management in adults: developed by the ASHP Commission on Therapeutics and approved by the ASHP Board of Directors on April 23, 2001. *Am J Health Syst Pharm* 2001;58:1645–1655.
  100. International Size Acceptance Association. ISAA Declares "Obesity Is NOT a Disease" Despite US Government Statement <[http://www.size-acceptance.org/not\\_a\\_disease.html](http://www.size-acceptance.org/not_a_disease.html)> (2003). Accessed 4 September 2007.
  101. Steadham A. Obesity is NOT a disease. *DOC News* 2004;1:10.
  102. National Association to Advance Fat Acceptance. NAAFA Policy: Obesity Research <[http://www.naafa.org/documents/policies/obesity\\_research.html](http://www.naafa.org/documents/policies/obesity_research.html)>. Accessed 4 September 2007.
  103. Smith SE. The great diet deception. *USA Today* January 1995 <[http://www.naafa.org/press\\_room/diet\\_deception.html](http://www.naafa.org/press_room/diet_deception.html)>.
  104. American Medical Association. House of Delegates Resolution 405: Recognizing and Taking Action in Response to the Obesity Crisis. Annual Meeting 2003, re-affirmed Annual Meeting 2004 <<http://www.ama-assn.org/ama1/upload/mm/annual03/d405a03.rtf>> (9 April 2003).
  105. Lambert M-L, Kohn L, Vinck I et al. Pharmacological and Surgical Treatment of Obesity: Residential Care for Severely Obese Children in Belgium. Health Technology Assessment. KCE reports 36C (D/2006/10.273/30). Belgian Health Care Knowledge Centre: Brussels, Belgium, 2006.

APPENDIX 1: INVALID ARGUMENTS PERTAINING TO WHETHER OBESITY IS A DISEASE

The article describes several major arguments regarding the question of whether obesity should be considered a disease. Here we list some of the other arguments that have been used to address this issue. Although we judge them to be patently invalid, we mention them because of their frequent occurrence.

Argument	Statement typifying the argument	Problems with the argument
Argument by analogy	Obesity is or should be considered a disease because hypertension, diabetes, and other conditions defined by somewhat arbitrary cutoffs on continuous scales are also diseases or are considered diseases.	This argument suffers from three major flaws. The first is faulty generalization. Even if it is true that hypertension and diabetes are or should be considered diseases, without knowing the key factors that led to a logical or scientific conclusion that they should be considered diseases, we cannot tell whether the analogy is appropriate for obesity. Simply pointing out similarities between two entities does not mean that those two entities necessarily belong to the same class. Second, if one is using the scientific approach, the argument assumes facts not in evidence. If, as we have argued, there is no clear definition of disease, how can we know scientifically that these other conditions qualify as disease? If we had a clear definition of a disease, we would not need to argue by analogy and could simply apply the definition in a scientific approach. Third, some proponents tweak the argument to state that those who have declared conditions such as hypertension and diabetes to be diseases have not been concerned with these subtle distinctions and therefore, when opining about the status of obesity as a disease, we also should be similarly unconcerned. This fallacious line of argument (formally, <i>tu quoque</i> ) is tantamount to saying we should not be concerned about doing something unreasonable if someone else has done something unreasonable.
<i>Argumentum ad hominem</i>	Obesity is not a disease because people who say it is a disease have financial motivations or other conflicts of interest.	This is simply an attack on a person or persons and has no bearing on the truth or reasonableness of a proposition.
<i>Non sequitur I</i>	Obesity is not a disease because there is no established effective treatment.	This argument suffers from two major flaws. The first is that it assumes facts not in evidence. It is not true that there is no established effective treatment for obesity. Clearly more effective treatments are sought, but some treatments such as lifestyle modification, bariatric surgery, and certain pharmaceuticals have all been shown to have some efficacy. More importantly, the argument is a <i>non sequitur</i> ; the conclusion in no way follows from the premise.
<i>Non sequitur II</i>	Obesity is one step away from being a true disease in that it increases risk of harm only by causing other diseases.	Some who oppose the labeling of obesity as a disease argue that most, if not all, of the increased risks of ill health or mortality caused by obesity can be accounted for by the identifiable diseases (e.g., hypertension, diabetes, nonalcoholic steatohepatitis, dyslipidemia, sleep apnea, cancer) that lie intermediary on the causal path between obesity and ultimate outcomes. There are two problems with this line of reasoning. First, every disease produces deleterious effects through pathways and mechanisms. The fact that those pathways and mechanisms are themselves labeled diseases does not seem to negate the appropriateness of labeling the more distal cause in the pathogenic sequence a disease. In fact, such exclusion might lead to an infinite regress in which almost nothing could be called a disease. Second, although obesity, like everything else, is assumed to work through paths and mechanisms, it is not at all clear that all of the ill effects of obesity are mediated solely through paths and mechanisms that are themselves labeled diseases.
<i>Argumentum ad numerum</i>	Obesity is a disease because most experts agree that it is a disease.	This argument suffers from two major flaws. First, it simply argues for the validity of the point on the basis that many people believe it, which has no bearing on the logical validity of the proposition. Second, it assumes facts not in evidence. We are aware of no well-designed survey of experts that represents an appropriate population of interest and shows that most members of that population hold a particular belief as to whether obesity is a disease. Still, clearly most members of the general public agree that obesity is a disease (6), and most authoritative bodies that have chosen to comment on this topic also seem to agree.

APPENDIX 2: STATEMENTS MADE BY AUTHORITATIVE BODIES REGARDING OBESITY AS A DISEASE

1. The National Academy of Sciences, established by an act of Congress in 1863, is composed of four organizations. One, the Institute of Medicine, created the Food

and Nutrition Board. In 1995, the Board's Committee to Develop Criteria for Evaluating the Outcomes of Approaches to Prevent and Treat Obesity published a report, *Weighing the Options* (81). The report states, "These figures [regarding the prevalence of obesity] point to the fact that obesity is one of the

most pervasive public health problems in this country, a complex, multifactorial disease... Obesity is a remarkable disease in terms of the effort required by an individual for its management and the extent of discrimination its victims suffer."

2. The Centers for Medicare & Medicaid Services (CMS) (82) wrote, "CMS opened this NCD [national coverage determination] to clarify the confusion resulting from statements in the current Coverage Issues Manual that indicated that obesity is not an illness. Because the Coverage Issues Manual is intended to address the coverage of particular care and services, rather than the definition of illness, we do not believe it is appropriate for the manual to address this issues.

Furthermore, our review of current literature indicates that there is no general agreement on the classification of obesity as an illness. For purposes of the Coverage Issues Manual, the critical issue is not the classification of obesity but whether particular items or services are reasonable and necessary." It is clear that the CMS was issuing a deliberate statement to clarify its position, which is that it is not making a determination as to whether obesity is an illness and, presumably, whether obesity is a disease.

3. According to clinical guidelines produced by the National Heart, Lung, and Blood Institute of the National Institutes of Health (NIH), "Obesity is a complex multifactorial chronic disease developing from interactive influences of numerous factors" (5).

4. An earlier statement following an NIH consensus conference said, "Current knowledge of human obesity has progressed beyond the simple generalizations of the past...this disease in man is complex and deeply rooted in biologic systems" (83). It is important to note, however, that although consensus conferences are sponsored by the NIH, the reports are independent of NIH staff input or review. This is thus a position of attendees at an NIH-sponsored conference, not of the NIH per se.

5. The World Health Organization (84) stated, "Obesity is a chronic disease, prevalent in both developed and developing countries, and affecting children as well as adults."

6. The Surgeon General of the United States, David M. Satcher, MD, speaking at an American Obesity Association conference on 15 September 1999, said, "If we don't get a handle on the risk factors in childhood, including being able to deal with the disease of obesity, then we have to look forward to a future in which there are going to be more and more people suffering from diabetes and hypertension and various forms of cardiovascular diseases" (85).

7. The Food and Drug Administration (FDA) stated quite clearly that it considered obesity to be a disease in its Regulations on Statements Made for Dietary Supplements Concerning the Effect of the Product on the Structure or Function of the Body; Final Rule (61): "FDA agrees with these comments that obesity is a disease." According to the FDA, obesity is a disease and the state of being overweight but not obese is not a disease.

8. The Federal Trade Commission, which has policed commercial weight-loss

practices, organized the Partnership for Healthy Weight Management. Members of the partnership agreed to comply with the Voluntary Guidelines for Providers of Weight Loss Products or Services, which refer to obesity as "a serious, chronic disease" (86). The partnership comprised representatives of the following academic, government, commercial, and advocacy organizations: the American Dietetic Association, the American Obesity Association, the American Society for Clinical Nutrition, the American Society of Bariatric Physicians, the Centers for Disease Control and Prevention, Comprehensive Weight Control, the Council on Size and Weight Discrimination, the University of Alabama at Birmingham's Department of Nutrition Sciences, the NIH's Division of Nutrition Research Coordination, the Federal Trade Commission's Bureau of Consumer Protection, George Washington University's Obesity Management Program, Health Management Resources, Jenny Craig, Inc., Knoll Pharmaceuticals, Lindora Medical Clinics, the Maryland Department of Health and Mental Hygiene's Division of Cardiovascular Health and Nutrition, the Medical University of South Carolina's Weight Management Center, the NIH's National Heart, Lung, and Blood Institute and National Institute of Diabetes and Digestive and Kidney Diseases, the New York Obesity Research Center, the North American Association for the Study of Obesity, Novartis Nutrition Corporation, Shape Up America!, the Slim-Fast Foods Company, Tanita Corporation of America, St. Luke's-Roosevelt Hospital's Nutrition and Weight Management Center, the University of Colorado Center for Human Nutrition, the FDA Center for Food Safety and Applied Nutrition, and Weight Watchers International, Inc.

9. Judy Dausch (87), senior manager for regulatory affairs at the American Dietetic Association, declared, "Obesity is a disease." She offers no rationale but suggests, "Until we establish a national consensus that obesity is a disease and must be treated as such, efforts to confront and curb this epidemic will be severely compromised."

10. "The Maternal and Child Health Bureau, Health Resources and Services Administration, the Department of Health and Human Services convened a committee of pediatric obesity experts to develop the recommendations...for physicians, nurse practitioners, and nutritionists to guide the evaluation and treatment of overweight children and adolescents." The committee wrote, "Obesity in children and adolescents represents one of the most frustrating and difficult diseases to treat...Obesity represents a chronic disease...Obesity is a chronic disease requiring lifelong attention" (88).

11. The International Classification of Diseases (ICD-9-CM) is based on the World Health Organization's International Classification of Diseases, ninth revision (ICD-9) (89). ICD-9-CM is the official system for

assigning codes to diagnoses and procedures associated with hospital utilization in the United States; the National Center for Health Statistics and the CMS is responsible for overseeing all changes and modifications. It lists "Obesity and other hyperalimentation" as #278.0 in the section "Endocrine, Nutritional, Metabolic and Immunity Diseases." The ICD-9-CM is recommended for use in all clinical settings but is required for reporting diagnoses and diseases to all US Public Health Service and Health Care Financing Administration programs. Note that the full name of ICD-10, the 10th edition, is the International Statistical Classification of Diseases and *Related Health Problems* (emphasis added); it includes conditions and situations that are not diseases but represent risk factors to health. ICD-10 is treated as an addendum to ICD-9, which remains the primary coding vehicle. ICD-10CM has several codes for obesity, including E65, localized adiposity; E60, obesity due to excess calories; E66.1, drug-induced obesity; E66.2, extreme obesity with alveolar hypoventilation; and E66.8, other obesity. The ICD is considered by many the definitive international classification of diseases and related health conditions. It is noteworthy that ICD-10CM does not distinguish between diseases in one section and related health conditions in another (90).

12. The American Association of Clinical Endocrinology/American College of Endocrinology Position Statement on the Prevention, Diagnosis, and Treatment of Obesity (1998 Revision) (91) says, "The objectives of this position paper are as follows: 1. Document that obesity is a disease."

13. The American Gastroenterological Association (AGA), in the first sentence of its Technical Review on Obesity (92), states, "Obesity is a chronic and stigmatizing disease that has become a major health problem in most industrialized countries because of its high prevalence, causal relationship with serious medical illnesses, and economic impact." The statement was approved by the AGA's Clinical Practice Committee and the Governing Board.

14. Obesity is listed in the *Professional Guide to Diseases*, 6th edition (93).

15. A Veterans Administration solicitation of applications contained this statement: "VA RR&D realizes that obesity is a complex disease process" (94).

16. A press release from the American Heart Association quoted the vice chairman of the Nutrition Committee, Robert H. Eckel, MD, as saying, "Obesity itself has become a life-long disease, not a cosmetic issue, nor a moral judgment—and it is becoming a dangerous epidemic." Later he changed his view, offering that obesity is only a disorder and not a disease (95), and the organization's subsequent official position statement on obesity refers to obesity only as a risk factor for disease (16).

17. The American Association of Family Physicians (96) recognizes obesity as a disease.
18. The American Society of Bariatric Physicians wrote that obesity has been “recognized since 1985 as a chronic disease” (97).
19. The American Obesity Association and Shape Up America! Guidance on the Treatment of Adult Obesity states, “Obesity is a disease afflicting millions of Americans and causing a great deal of pain and suffering” (98).
20. The American Society of Health-System Pharmacists, in a formal position statement on the use of pharmacotherapy for obesity treatment, wrote, “Obesity is a chronic disease that may require pharmacologic treatment” (99).
21. At least one advocacy organization, the International Size Acceptance Association, has issued an explicit and formal statement that obesity is not a disease (100,101).
22. Another advocacy organization, the National Association to Advance Fat Acceptance, seems to believe that obesity is not a disease (102). Although it is not clear whether there is a formal statement to that effect, the writings of many of the organization’s leaders, including executive director Sally Smith, make this perspective clear. For example, Smith wrote, “Researchers are positioning obesity next to hypertension, as a chronic disease requiring lifelong treatment, even though there is no evidence that obesity significantly decreases longevity” (103).
23. The American Medical Association (AMA) has seemingly offered two opposing statements. The video it sponsored (44) clearly indicates that obesity does not meet the organization’s criteria for a disease. However, a resolution on this matter states that the AMA “will collaborate with appropriate agencies and organizations to commission a multidisciplinary task force to review public health impact of obesity and recommend measures to better recognize and treat obesity as a chronic disease.” In the justification of that resolution, the committee stated, “There was some concern over the designation of obesity as a chronic disease, but your Reference Committee did not find this persuasive, particularly in light of the many adverse health outcomes associated with obesity and the fact that overweight and obesity is a multifactorial condition. Moreover, like other chronic conditions, obesity will require patients to actively participate in their care” (104).
24. The Belgian Health Care Knowledge Centre (105), founded by the Belgian government in 2002, falls under the jurisdiction of the Ministry of Public Health and Social Affaires and is responsible for the realization of policy supporting studies within the sector of health care and health insurance. This organization has provided statements on the issue that seem to directly contradict one another. One says, “Is obesity a disease? Severe obesity, as smoking, is a risk factor for increased morbidity and mortality, but a risk factor is not a disease. Smoking for instance is never called a disease....But—disease or not—obesity is a cause of much suffering, and the medical community is confronted with it.” Others have contained the following: “Obesity can be defined simply as the disease in which excess body fat has accumulated to such an extent that health can be adversely affected”; “Obesity is a medical disease to the extent that it affects health, because of associated morbidities (hypertension, diabetes, arthritis, sleep apnea)”; and “There is evidence to support the idea that some forms of paediatric obesity should be considered as a disease that has to be treated.”
- APPENDIX 3: DOCUMENTS RELATING TO THIS TOPIC THAT WERE REVIEWED BUT NOT CITED IN TEXT**
- Aronne LJ. Obesity as a disease: etiology treatment, and management considerations for the obese patient. *Obes Res* 2002;10:95S–96S.
- Bertièrre M-C. L’obésité est-elle une maladie? [French]. *Revue de l’infirmière* 1986;36:17–19
- Bjorntorp P. Obesity: a chronic disease with alarming prevalence and consequences. *J Intern Med* 1998;244:267–269.
- Bray GA. Obesity: the disease. *J Med Chem* 2006;49:4001–4007.
- Cawley J. The impact of obesity on wages. *J Hum Resources* 2004;39:451–474.
- Eckel RH, Krauss MR. American Heart Association call to action: obesity as a major risk factor for coronary heart disease. *Circulation* 1998;97:2099–2100.
- Editorial: The chronic disease of childhood obesity: the sleeping giant has awakened. *J Pediatr* 2000;136:7113.
- Examination Committee of Criteria for Obesity Disease in Japan, Japan Society for the Study of Obesity. New criteria for “obesity disease” in Japan. *Circ J* 2002;66:987–992.
- Friedenberg RM. Obesity. *Radiology* 2002;225:629–632.
- Fujioka K. Management of obesity as a chronic disease: nonpharmacologic, pharmacologic, and surgical options. *Obes Res* 2002;10:116S–123S.
- Hill JO. Dealing with obesity as a chronic disease. *Obes Res* 1998;6:34S–38S.
- Husemann BJ. Obesity: an innately incurable disease? *Obes Surg* 1999;9:244–249.
- Jeffcoate W. Obesity is a disease: food for thought. *Lancet* 1998;351:903–904.
- Jones AJ. Federal Court responses to state and local claims of “undue burden” in complying with the Americans with Disabilities Act. *Publius* 1994–1995;25:41–54.
- Jutel A. The emergence of overweight as a disease entity: measuring up normality. *Soc Sci Med* 2006;63:2268–2276.
- Kassirer JP, Angell M. Losing weight—an ill fated New Year’s resolution. *N Engl J Med* 1998;338:52–54.
- King EB, Shapiro JR, Hebl MR, Singletary SL, Turner S. The stigma of obesity in customer service: a mechanism for remediation and bottom-line consequences of interpersonal discrimination. *J Appl Psychol* 2006; 91: 579–593.
- Kopelman PG, Finer N. Reply: is obesity a disease? *Int J Obes* 2001;25:1405–1406.
- Kristen E. Addressing the problem of weight discrimination in employment. *California Law Rev* 2002;90:57–109.
- Kuss CL. Absolving a deadly sin: a medical and legal argument for including obesity as a disability under the Americans with Disabilities Act. *J Contemp Health Law Policy* 1996;12:563–605.
- Mayer K. An unjust war: the case against the government’s war on obesity. LexisNexis Academic, 2004 *Georgetown Law Journal* 92 GEO. L.J. 999.
- O’Brien PE, Dixon JB, Brown W. Obesity is a surgical disease: overview of obesity and bariatric surgery. *ANZ J Surg* 2004;74:200–204.
- Rippe JM, Crossley S, Ringer R. Obesity as a chronic disease: modern medical and lifestyle management. *J Am Diet Assoc* 1998;98 (Suppl 2):S9–S115.
- Rossner S. Obesity: the disease of the twenty-first century. *Int J Obes* 2002;26(Suppl 4): S2–S4.
- Sanofi-Aventis comments, Line 72. Obesity Is a Chronic, Relapsing Health Risk Defined by Excess Body Fat. Docket 2007D-0040: Guidance for Industry on Developing Products for Weight Management <<http://www.fda.gov/ohrms/dockets/dockets/07d0040/07d-0040-c000004-vol1.pdf>> (10 April 2007).
- Scherger JE. Obesity as a chronic disease. *West J Med* 1997;167:178.