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Democracy Dies in Darkness

Why BMI is a flawed health standard, especially for people of color

By Carly Stern
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CORRECTION

An earlier version of this article incorrectly said that body mass index is weight divided by height. It is weight in kilograms divided by height in meters squared. The article has been corrected.

When Achea Redd used to go for annual checkups, she tried to discuss her restrictive eating patterns with her doctors and her fear that she might have an eating disorder. But because her body mass index (BMI) was in the "overweight" category, Redd's primary care physicians refused to consider the possibility that she might be depriving herself of food and instead counseled her to lose weight, she said.

It wasn't until two years ago — when Redd, a Black woman, was 38 — that a therapist diagnosed her with "atypical anorexia," a condition that doesn't present with low body weight. Even then, her insurance wouldn't cover treatment because of her BMI category. "Getting a doctor, a medical doctor, to sign off on me having an eating disorder was impossible," she said. Redd began paying up to $800 out of pocket monthly to work with a therapist and dietitian.

The use of BMI — a person's weight in kilograms divided by height in meters squared — is deeply integrated into U.S. health-care systems. The World Health Organization and the National Institutes of Health use BMI to define obesity. A patient's weight, which is among the first measurements taken during hospital admissions, is calculated for BMI and checked against thresholds, or what experts call "cut points." During the coronavirus pandemic, certain jurisdictions prioritized people with higher BMIs in vaccine distribution plans because some research suggests that obesity can be a risk factor for more severe covid-19 outcomes.

But the measure has long been controversial among obesity experts, dietitians and the public. Many experts debate its effectiveness for people of all races and ethnicities — and criticize how it has become overinterpreted as a catchall proxy for body fat, nutritional status and health risk. Some say that assumptions, practices and policies based on BMI adversely affect Americans of color by shaping the diagnoses they receive, treatment they access and stigma they may face. And, they say, the measure's very origin is racially problematic.

BMI was invented about 200 years ago in an era that saw the creation of pseudoscientific theories such as social Darwinism that were used to justify nationalism, racism and eugenics. The index was established by Belgian mathematician Lambert Adolphe Jacques Quetelet, who sought to measure the height and weight of the "average" man based on a sample of White, European men. He saw this average as an ideal.

BMI cut points have their roots in the Metropolitan Life Insurance Company's attempt to establish "how weight might play a role in someone's likelihood of dying" in the 1940s, said Fatima Cody Stanford, an obesity medicine physician scientist at Massachusetts General Hospital and Harvard Medical School. The company used the BMI formula and several decades of data from mostly White policyholders to create actuarial tables. Physiologist Ancel Keys later coined the term "body mass index" in 1972.

Today, some experts argue, this measure is no longer relevant to the country's population. America's demographic fabric has dramatically shifted over the past century. People of color make up 40 percent of the U.S. population, and research has shown that Black and White people tend to have different body compositions. While the WHO released adjusted cut points for people of Asian descent, who have a higher risk of certain metabolic diseases at lower BMI, leading institutions have not adopted metrics specific to Latino and Black people. So when BMI is applied to everyone in the country, "we presume that how we were in the 1940s really reflects how we are in 2021 — and you can see how that might be problematic," said Stanford.

The measure's ubiquity affects how people of color navigate health-care settings and interact with doctors, along with the quality of care they receive. Stigma, lack of nutritional expertise and misunderstanding about BMI can lead providers to underdiagnose some conditions and overdiagnose others, said Stephanie Nicole Carter, a registered dietitian nutritionist who owns a private practice and works as a clinician. "We're missing other things that may or may not be going on with them," she said.

BMI also limits eligibility for particular anti-obesity medications and surgeries, said Jamy Ard, a clinical researcher at Wake Forest Baptist Health who focuses on obesity treatment and health disparities. He pointed to gastric bypass surgery, the treatment suggested for those with a BMI of 35 or greater who have a complication of obesity such as diabetes or sleep apnea.

"If I have a patient who has a BMI of 33, for example, but they have really bad Type 2 diabetes . . . they might benefit from a metabolic surgery," he said, but they can't get it.

"Your insurance won't cover it because that's the guideline," Ard said, adding that the procedure can cost up to $27,000 out of pocket. These restrictions matter because Black patients already receive less obesity treatment than White patients — despite facing a higher prevalence of obesity, according to BMI.

Some military forces also use weight-by-height standards to calculate BMI and determine eligibility for service, said Steven Heymsfield, a physician scientist and professor at the Pennington Biomedical Research Center who specializes in obesity. Although the Army's standards vary by age group and gender, for example, they don't vary by race and ethnicity. If people's BMI exceeds a given threshold, they might only be considered after measures such as a neck circumference test or body fat assessment, Heymsfield said.

Despite the BMI's reach, leading experts can't quite identify why certain values were chosen for cut points and what those values represent. A person is labeled in the overweight category at a BMI of 25 and in the obesity category at 30 or greater. "These are arbitrary numbers," said Katherine Flegal, a retired senior scientist from the Centers for Disease Control and Prevention, adding that such values might have been chosen due to "digit preference" — because people often prefer numbers ending in 5 or 0.

Experts are divided about what to do about the controversial measure.

Donna Ryan, professor emerita at Pennington Biomedical Research Center, thinks BMI is here to stay, though she says doctors should change their approach to it. "BMI is part of the core measures in the electronic health record," she wrote in an email. But, she added, doctors should expand their limited understanding of the measure to include racial and ethnic variation, and should stop using it to assess individual body fat status. "They all passed the MCATS, they can certainly learn the nuances of using BMI as a screening tool and then make a clinical diagnosis based on health assessment."

Ard echoed that BMI is worth keeping, flaws and all, because many still don't regard obesity as a disease and doctors often fail to offer concrete treatment. "We'd love to have a better marker that actually gets at the physiologic state of the fat cell," Ard said. "Until that point, this is what we have as a way to at least initiate conversations and start to talk about some general treatment strategies."

Stanford is among the researchers who have proposed adjustments to the index to reflect racial and ethnic variation in body composition. She and her colleagues used data from the National Health and Nutrition Examination Survey between 1999 and 2016 to suggest BMI curve shifts for Black, White and Latino people that correspond with metabolic risk. Their findings, presented in the Mayo Clinic Proceedings in 2019, suggest that cut points for Black, White and Latino men shift downward. Cut points for Latinas and White women also would be lower, while thresholds for Black women would be higher.

But others in the field favor scrapping the measure altogether, pointing to heightened national focus on systemic racism as a moment to call attention to disparate treatment that can stem from BMI — and usher in new approaches designed for all bodies. "This level of mistrust between Black communities and the health-care system needs to come to some sort of head, and I think we're there now," said Carter, the dietitian.

Redd, the misdiagnosed patient who is actively working on her recovery, agrees. "The season is ripe for change, and the world is starting to look a lot different," she said. "It's the time and day, probably, for some sort of reckoning."

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