

**THE NUMBERS GUY**  
By CARL BIALIK



## Obesity Study Looks Thin

**Results Warn That Everyone in U.S. Will Be Overweight by the Year 2048**

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In 40 years, every single American could be overweight, according to a recent study. Employing that same logic, 13 out of every 10 adult Americans by then won't have landlines.

The phone forecast is impossible, of course, but it's arguably no less solidly grounded than the obesity forecast. The weight projection uses three data points spread out over nearly three decades to estimate a linear trend -- then brazenly draws that line into the future.

The result: 86.3% of American adults will be overweight or obese in 2030, compared with 66.3% by the government's latest estimate. By 2048, the percentage will reach 100%. The study doesn't go beyond that date, but that upward trend would reach logical impossibility the following year.

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"Extrapolations are dangerous," says Donald Berry, chairman of the department of biostatistics at the University of Texas M.D. Anderson Cancer Center. "Especially dangerous is to assume that trends are linear. Otherwise we'd conclude that Olympic swimmers will one day have negative times, there will be more Internet users than people, and more people on Earth than molecules in the universe."

Predicting an entirely overweight populace was a sure way to get attention and the study, which appeared online in the Nature Publishing Group journal *Obesity* last month and will be printed in October, did just that, making appearances on Reuters and the Drudge Report. But unrealistic projections can backfire by chipping away at public attention to an issue.

Already, public warnings about obesity have been undermined by a big write-down in 2005 of government estimates of obesity-related deaths and by flaws in the determinant of obesity, body mass index, that leads muscular people such as Arnold Schwarzenegger and Mel Gibson to be categorized as overweight, as *The Wall Street Journal* pointed out in 2002.

The recent study was intended by lead author Youfa Wang "to send a message" to public-health officials, he says. Dr. Wang, associate professor of international health and epidemiology at Johns Hopkins University, adds that there is no conflict between this goal and the standards of scientific inquiry. He notes the scientific pedigree of his co-authors, who include Hopkins colleagues, and researchers at the University of Pennsylvania and at the federal Agency for Healthcare Research and Quality.

The researchers used numbers from an annual government study of Americans' health, called the National Health and Nutrition Examination Survey. Researchers interview thousands of randomly selected Americans each year, then conduct physical exams on those who are willing, to gather vital statistics and disease rates.

The study is expensive, and the Centers for Disease Control and Prevention conducted it only intermittently until 1999, when it became an annual project. Even today, results must be aggregated over several years to become statistically significant over subgroups of the population -- and the results tend to come out years after they were gathered.

In trailers outfitted with medical equipment, volunteers get height and weight tests. The resulting values are converted to body mass index by dividing weight, in kilograms, by the square of height, in meters. Overweight once was defined as having a BMI of 27 or higher, but for purposes of consistency the study used today's cutoff of 25; obese means a value of 30 or higher.

Dr. Wang and colleagues looked at four sets of surveys: 1971-1974, 1976-1980, 1988-1994 and 1999-2004. In a sign that a linear trend may not be on target, the earliest results were excluded because there wasn't a significant increase heading into the next set of data. Then, they used a statistical technique called linear regression to find the best linear trend. These lines were extended into the future, yielding predictions for 2010, 2020 and 2030 -- and the possibility of an overweight nation in 2048.


"Projecting obesity trends that far out is a very unreliable exercise," Duke University biostatistician David Dunson says.

Dr. Wang plays down the predictive power of the results, even though the study says it "predicted" obesity rates and calls the numbers "projections."

"This study isn't designed to predict what the future actual situation will be," Dr. Wang says. "We just say, if you take these assumptions, this is what the future may be."

Those assumptions are questionable, Dr. Berry says. "We'll be 'saved' from 100% by heterogeneity in the gene pool even if not by changes in behavior."

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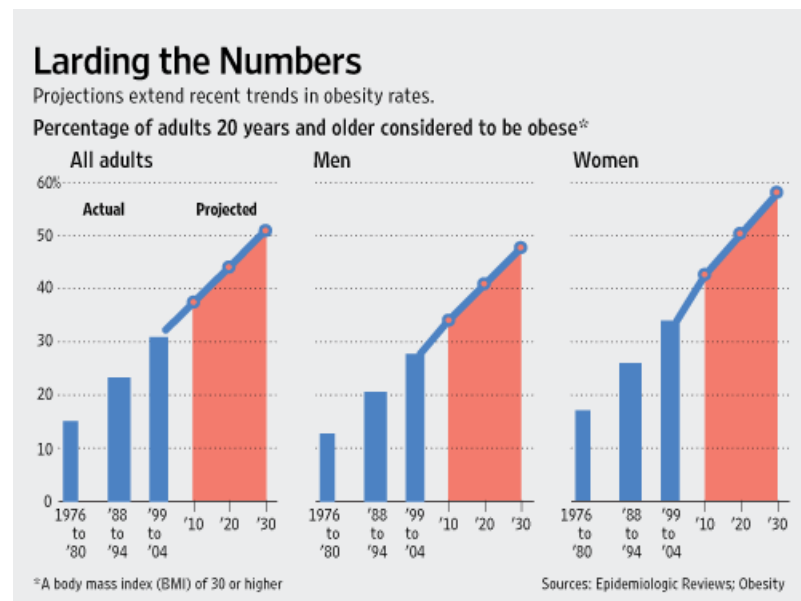
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Richard Bergman and David Allison, editor and associate editor, respectively, of Obesity, wrote in an email: "Each scientific paper is hoped to be an ever closer approximation to the best possible answer to a question than was the work that had gone before. We believe Dr. Wang's paper fulfills that spirit."

Predicting health trends is a risky venture when even today's stats are uncertain. Charles B. Hall, a biostatistician at Albert Einstein College of Medicine in the Bronx, points out that the number of AIDS cases in the U.S. appeared to be leveling off in 1989 -- until a statistician found that reporting delays, not progress against the disease, explained the apparent trend. Earlier this month, the CDC revised its estimate of new HIV infections in 2006 upward, by 16,000 to about 56,000, not because of an actual increase but because of improvements in detection.

Projecting weight gain isn't like projecting rates of infection for a disease, which is a simpler, yes-or-no projection. A small weight gain can push someone who was near the threshold into overweight status. As it happens, the most-popular place for Americans to reside on the weight curve in recent decades has been right near that threshold.

Dr. Wang's study includes a more-sophisticated projection of that weight curve, which predicts a still-alarming 78.9% of American adults being overweight by 2030. But it was the 86% figure that made the headline of the Johns Hopkins news release.



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