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SCIENCE

Is one drink per day really unsafe? That new alcohol study, explained.

A Lancet study shows everything that's wrong with nutritional epidemiology, and the way we talk about it.

by **Julia Belluz**

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“The safest level of drinking is none.” This was the stunning conclusion of a big paper that appeared last week in the *Lancet* — one that prompted dozens of news stories warning of the dangers of even the lowest levels of alcohol consumption.

The researchers wanted to estimate alcohol use and the burden of alcohol-related disease in 195 countries. So they looked at more than 700 studies from around the world, involving millions of people, and came up with a statement about what safe drinking looks like.

Their reasons for going to all this trouble were clear: Alcohol is a massive health and social problem worldwide. Excessive drinking can, over time, increase the risk of everything from liver disease to high blood pressure, injury, and memory and mental health problems. So getting a sense of the global health impact of drinking — the seventh leading risk factor for premature death and disease overall, they determined — was a worthwhile effort.

“But while the paper is so nice and so useful [at estimating alcohol’s disease burden],” Stanford meta-researcher John Ioannidis told me, “at the last moment it destroys everything.” Instead of focusing on the message about the dangers of excessive drinking, “it focuses on making a claim that no alcohol use is safe.”

Not only did the data in the paper not support a zero drinks recommendation, but the authors were also guilty of doing what too many nutrition researchers do: They used definitive, causal language to talk about studies that are only correlational. That’s something Ioannidis, a longtime critic of nutrition science, recently called out as a major source of confusion for the public. In a new paper, he argues that the field of nutritional epidemiology is in need of radical reform.

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over time and then look at their rates of disease, trying to tease out relationships in the data and generate hypotheses for future research. Do people who drink more red wine have lower rates of heart disease? Is eating yogurt and nuts linked with a longer life span?

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These studies aren't controlled like randomized trials, where study participants are randomly split into groups and assigned to different interventions. That means the authors of observational studies can't actually tell us whether one thing *caused* another thing to happen — only that two things are *associated*.

Observational studies are also riddled with confounding factors, the unmeasured variables that may actually give rise to certain outcomes.

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lifestyle factors — or just their choice of beer and spirits — that caused their disease risk to shoot up? Researchers try to control for these confounders but they can't capture all of them.

And even in the best-controlled studies of eating and drinking, it's just incredibly difficult to tease out whether a single nutrient, food, or drink truly caused a specific health outcome.

As Ioannidis points out in his new paper, "Individuals consume thousands of chemicals in millions of possible daily combinations." We also prepare our foods in thousands of different ways, and when you add one thing to your diet, you take another away. Teasing out the influence of these variables on health outcomes is "challenging, if not impossible," Ioannidis added.

That's why observational studies in nutrition are only supposed to be hypothesis-generating, not a source for definitive statements about how a single food or nutrient increased or decreased the risk of a disease by a specific percentage.

You wouldn't know that if you read the conclusions of nutrition studies and especially much of the reporting on nutrition studies. If someone meta-analyzed the evidence from cohort studies (a type of observational research) on various foods, Ioannidis writes, tongue in cheek:

... eating 12 hazelnuts daily (1 oz) would prolong life by 12 years (ie, 1 year per hazelnut), drinking 3 cups of coffee daily would achieve a similar gain of 12 extra years, and eating a single mandarin orange daily (80 g) would add 5 years of life. Conversely, consuming 1 egg daily would reduce life expectancy by 6 years, and eating 2 slices of bacon (30 g) daily would shorten life by a decade, an effect worse

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Ioannidis suggested in his new paper. And we — journalists, researchers, policymakers — should avoid making these types of statements based on nutritional epidemiology altogether.

What the new alcohol paper really showed

But unlike the spurious conclusions Ioannidis cited — about how eating a little bacon or an egg will shave years off your life — heavy levels of alcohol consumption have been proven to have terrible health consequences.

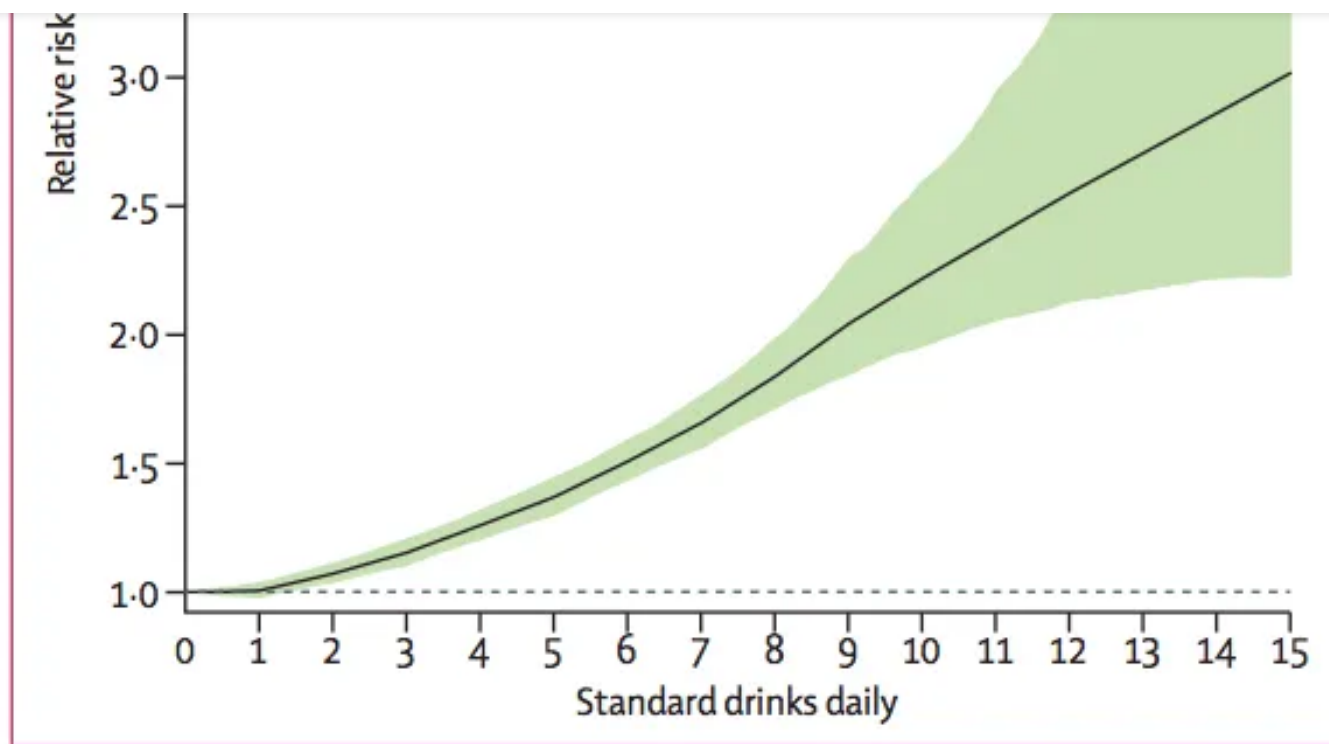
“If eggs are bad, even if you eat eight eggs a day, this is no big deal, while with eight drinks of alcohol a day, the risk of disease and death is tremendous,” Ioannidis summed up. And since heavy drinking isn’t socially acceptable, there’s a high degree of underreporting that happens and a real chance that alcohol’s actual burden is underestimated.

While no one disputes the damaging effects of heavy drinking, there is a lively debate about what constitutes healthy moderate drinking (and concern about the alcohol industry biasing research about the benefits of light drinking). But the new *Lancet* paper went much further and made the bold claim that people should drink nothing because even a *single drink* per day is problematic.

To understand why this assertion is absurd, take a look at this figure from the study, which tracks how the risk of alcohol-related health problems increases by the number of drinks consumed each day:

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The relative risk of alcohol for all attributable causes, by standard drinks consumed per day. [Lancet](#)

The authors focused on the risk increase between zero and one drinks per day, and suggested “consuming zero standard drinks daily minimized the overall risk of all health loss.” Yet you’ll notice the risk between zero and one, in the bottom left corner of the chart, is virtually indistinguishable. In fact, the risk curve only starts to increase *after* one drink, or even one and a half.

So that’s why suggesting people don’t drink anything based on this data is misleading, Cecile Janssens, a research professor of epidemiology at Emory University, told Vox. “This paper shows that very heavy drinking is unhealthy,” she said, “but it doesn’t show that zero drinks is the safest.”

The major result in the paper’s press release, and the one most highlighted in the news

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day means four more people in 100,000 per year will experience an alcohol-related problem. Here's Carroll:

For each set of 100,000 people who have one drink a day per year, 918 can expect to experience one of the 23 alcohol-related problems in any year. Of those who drink nothing, 914 can expect to experience a problem. ... At two drinks per day, the number experiencing a problem increased to 977. Even at five drinks per day, which most agree is too much, the vast majority of people are unaffected.

Put another way, statistician David Spiegelhalter estimated that 25,000 people would need to drink 400,000 bottles of gin to experience one extra health problem compared to non-drinkers, "which indicates a rather low level of harm in these occasional drinkers."

So again, the difference in health risk between those who drink nothing and those who have one daily drink is tiny — and, given the weak observational research it's based on, potentially not meaningful.

"Telling people not to drink anything is a stretch," Ioannidis said. "We really need to have large randomized trial evidence to be able to make such a recommendation, and we don't have one."

So for now, we don't know the precise threshold over which alcohol consumption gets risky, but based on this study, it certainly looks like more than zero drinks. So perhaps the question is why the study authors, and the *Lancet* press office, stretched their findings so far. If I'm being generous, I'd say they were driven by a desire to draw attention to alcohol's great health burden. But I think they were also playing into the public's desire for wild nutrition claims — a desire we need to stop feeding.

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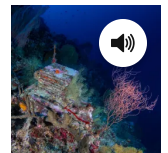
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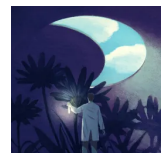


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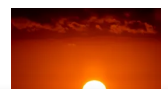
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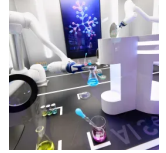




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