

Do cell phones cause cancer? Unlikely, but activists are skeptical of journalists who present the facts

Does electromagnetic radiation from cell phones pose a public health risk? To some people, the question seems paranoid. To others, convinced that their devices are proven hazards, the question seems dangerously naïve. And therein lies a vexing challenge for science journalists: How do you cover an issue when the stakes for human health seem so high, scientific questions still linger, and passions run so deep?

At issue here is the low-energy radiation emitted by cell phones and other personal electronics. These kinds of electromagnetic fields don't directly damage bonds in DNA, and the Federal Communications Commission, the Food and Drug Administration, and other government agencies generally consider them safe at the levels associated with cell phones. "The majority of studies published have failed to show an association between exposure to radiofrequency from a cell phone and health problems," the FDA [states unequivocally](#) on its website.

It's true, of course, that some individual studies have suggested potential links between this sort of radiation and a range of health problems. And in the next few weeks, the U.S. National Toxicology Program, part of the [National Institute of Environmental Health Sciences](#), is expected to release the final results of a \$25 million study of the effects of cell phone radiofrequency radiation on rats. Preliminary results from the study, [released](#) in May of 2016, suggested a link between cell phone radiation and tumor formation.

At the same time, it's possible to find data suggesting low-level risks from many things, ranging from fluoride to vaccines, even though there is little aggregate evidence of a public health crisis. And it's worth [noting](#) from some scientists.



Still, as more people — and more and more children —

spend time with cell phones, the murky margins of scientific evidence and lingering uncertainty are very likely to stir more concern and debate. And for reporters who step into this conversation and raise advocates' ire, the backlash can be swift and robust. That response was on display last month, after the California Department of Public Health [released](#) new guidelines for "individuals and families who want to decrease their exposure to the radio frequency energy emitted from cell phones."

In response, the magazine Popular Science ran a [story](#) under the headline "There's no evidence that cell phones pose a public health risk, no matter what California says." In the piece, Popular Science reporter

Sara Chodosh gave a rundown of why it's so difficult to study the safety of phones, concluding: "There's no evidence that cell phones are dangerous to your health. Period." She also accused the State of California of fear-mongering about phone safety, and ended her piece by telling readers, "Heck, you could duct-tape [your phone] to your face if you so choose."

Shortly afterward, in a [brief segment](#) on the public radio show Science Friday, host Ira Flatow and his guest, Popular Science senior editor Sophie Bushwick, built on Chodosh's story. "There's no strong evidence to suggest that these devices aren't safe," said Flatow. "It's creating a lot of fear around an issue that we're not sure people actually need to be afraid of," Bushwick explained on air.

Within days, activists began writing to Science Friday, accusing the show of spreading misinformation, endangering public health, and dramatically misrepresenting the science. The activists connected through email lists, and many of the irate messages seemed to follow a pre-written template. (One email writer in Maryland, for example, after receiving a query from Undark, admitted that she had not actually listened to the Science Friday show.)

But the email messages — dozens of which were copied to staff at Undark — also included personalized, furious commentary on Flatow and Bushwick's conversation. "I will not mince words. Your radio program about cell phones and the [California Department of Public Health] document was appalling," began a message from [Ellie Marks](#), a longtime advocate for safety warnings on cell phones and the founder and director of the California Brain Tumor Association. When I called up Marks, who became interested in this issue after her husband was diagnosed with brain cancer in 2008, she took particular issue with the tone of the coverage. "There's an extensive amount of science on this. And Popular Science and [Science Friday] ignored that — to the point of sarcasm," Marks said. "Saying that it's okay to duct tape your phone to your face? I mean, even if you look at the user manual, they all tell you that you should not put a phone to your body!"

During our conversation, Marks suggested — without offering evidence — that both national cancer statistics and the Popular Science article could have been influenced by industry pressure. "We feel that they use people — they have certain people that they use to get their message out," she said.

The Environmental Health Trust, a Wyoming-based nonprofit, has criticized the Science Friday segment and [called on](#) Popular Science to retract its original piece, offering a point-by-point challenge to large sections of the article. "This is a classic example, if you get a naïve reporter who doesn't know much about the issue, and you give them the information that comes straight from the industry propaganda," said Devra Davis, an epidemiologist and the founder of EHT, in an interview with Undark.



Truth, Beauty, Science

Davis, who has written books about tobacco and cell phone safety, described the Popular Science article as "a remarkable piece of disinformation," and expressed disappointment that Science Friday had picked it up. "That was really a tragedy, as far as I'm concerned, and really irresponsible on their part," Davis said.

It's certainly true that Davis and other advocates can point to numerous peer reviewed studies suggesting a possible link between non-ionizing radiation — of the kind emitted by cell phones and other personal electronics — and a host of health conditions, including [miscarriage](#), [glioma](#), [neurological problems](#), and [male infertility](#).

And it's not necessarily the case, as the Popular Science article and other coverage sometimes suggests, that because these sorts of non-ionizing radiation cannot break the bonds in DNA, they cannot have an impact at the cellular level. "We know they interact with biological tissue. Period," said Jerry Phillips, a biochemist at the University of Colorado-Colorado Springs who has published extensively on the effects of such radiation on cells. "We don't know what the nature of that interaction is, number one. And number two is, we still don't have an idea of what the active component is, or components are, because we don't have a clue as to what constitutes a dose."

For Davis, this kind of uncertainty is worrying. "We are currently in the middle of the largest experiment in human history, for which people have never given consent," she said.

Not everyone is convinced, though, that these findings add up to anything remotely like a full-blown public health emergency. Much of the most-cited research in this field has been performed on rats or tissue cultures, not human beings. Large epidemiological studies can suggest correlations, but they struggle to establish clear lines of causation. And perhaps most tellingly, nearly two decades after the widespread introduction of cell phones in industrialized countries, brain cancer rates have not spiked.

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From a 2010 study in the journal Neuro-Oncology. The top chart shows cell phone subscribers in the U.S. The bottom shows age-adjusted incidence of brain cancer.

“There’s nothing much happening with brain cancer. It’s just flat. The same rates per 100,000 people are getting brain cancer today as they were before cell phones,” said Simon Chapman, an emeritus professor at the University of Sydney School of Public Health and the lead author of a 2016 [study](#) of the relationship between cell phone adoption and brain cancer rates in Australia. “I’m not seeing any major international or national cancer bodies who can gather together the best evidence, the best experts, and publish consensus statements saying that this is something the public should be worried about,” Chapman told Undark.

“The only groups waving the red flag and saying ‘stop’ are fringe groups, people like Devra Davis and her group of cohorts,” he added. For her part, Davis simply counters that brain tumors take a long time to develop — and [there is evidence](#) that glioma rates are, in fact, beginning to rise.

Science Friday’s Flatow did not respond to multiple requests for comment, though in an email to one of his many agitated email correspondents, which was forwarded to Undark, the host indicated that upon

release of the looming National Toxicology Program report, Science Friday plans to “revisit the issue in depth, as we have done in the past.” In a phone interview, Rachel Feltman, the science editor at Popular Science, stood by the magazine’s story. “All the reputable health agencies have looked at the available studies and the available evidence and concluded that cellphones almost certainly are not a health risk,” Feltman said.

“I think we make it very clear in our piece that, yes, there are individual studies that can be interpreted that way,” she added. “But when you look at the body of evidence as a whole, the scientific consensus is clear.”

In some ways, the disagreement here seems to hinge on how different stakeholders understand the word “evidence,” and how much of it they believe is necessary to present an actual risk. Does “evidence” simply mean that there is some reputable research out there that points, however tentatively, to a possible effect or impact — and if so, is that by itself something to fret over? Or does “evidence” mean, as Feltman suggests, that a clear scientific consensus has coalesced around one particular conclusion or another?

These aren’t, of course, strictly scientific questions. They’re moral and political — and even emotional and psychological ones, too. And all of that cuts to the heart of a quandary facing science journalists everywhere: On questions of scientific uncertainty and health, what does the public need to know? Should the press, in covering cell phone safety, give equal weight to every incremental study suggesting some possible health risk — or provide a platform for worried advocates each time such a study turns up in the scientific literature? Such a world would be a paralyzing and fearful place. And of course, some preliminary scientific concerns do prove [overblown](#) in the [fullness of time](#).

At the same time, it’s sobering to think of a world where the public is simply assured that everything is definitely okay — at least until a consensus forms and enough scientists get together and tell them that it’s not. Science is littered with examples of toxins and pollutants that were long thought to be safe, or at least not demonstrably dangerous — [tobacco](#), [lead paint](#), or even the radium-laced products [for which this very publication is named](#) — only to be revealed later as hazardous.

So are studies that suggest a *possible* risk from the low-energy radiation emanating from cell phones and other tools of modern life something to worry about — particularly against the backdrop of far more numerous studies that, at least to date, have found no real cause for concern? Probably not — until they are. And it’s that sort of fuzziness — always just shy of absolute certainty — that makes reporting on the issue so dicey.

“If a single study shows a result of something, that’s not quite the same as saying there’s evidence that that thing is true,” PopSci’s Feltman said. “It means one study suggested that there might be evidence that that thing was true.”

That’s exactly right. But it’s also cold comfort for folks like Ellie Marks, who are unshakably convinced that technology makers — and the press — are ignoring too many of those single studies.

“No one is saying give up your cell phone,” Marks said. “We want people to make informed decisions for themselves and their families about something that even children are using.”

Michael Schulson is an American freelance writer covering science, religion, technology, and ethics. His work has been published by Pacific Standard magazine, Aeon, New York magazine, and The Washington Post, among other outlets, and he writes the Matters of Fact and Tracker columns for Undark.

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