Public Concerns over Microwave Radiation in the U.S.: Comparing the Perceived Health Risks of Phones and Towers

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There is a dramatic difference between public concerns in the U.S. over exposures to microwave radiation from mobile phones and from their towers.

While both phones and towers are sources of the same type of radiation, human exposures are much greater from the phones than from the towers. The output power of the towers may be two to three orders of magnitude greater than that of the phones, but the phones are held just a few centimeters from the body (especially the brain and the eyes) of the user. Approximately 50-70% of the power output of the phone is absorbed by the user.

Yet, there is much more public activism over the siting of the towers than over the use of the phones. Dozens of local citizen groups have sprung up to fight towers, as well as one national umbrella group, the EMR Network. No comparable organizations are working on the mobile phone–health issue. No one is openly lobbying for the disclosure of specific absorption rate (SAR) data from different models of phones and few are promoting research on potential chronic radiation health risks.

Consumer Reports, the leading U.S. consumer magazine, has ignored cell phone health risks and has not done any testing. Unlike the Green Party in Europe, American environmentalists have never targeted „electrosmog“ as a core concern. Individual local groups may oppose military or civilian radars, a power line, a substation, a TV or radio transmitter or a microwave tower, but they do so in isolation with no apparent realization that they have a shared set of concerns.

A Short History of the Mobile Phone Controversy

The mobile phone health issue began in January 1993 when a widower blamed cell phone radiation for his wife’s death from a brain tumor on the widely-watched Larry King Show, televised on CNN. (David Reynard had filed a wrongful death lawsuit six months earlier, but that passed relatively unnoticed.) As a result, the stock market value of cellular phone stocks crashed and prompted the industry to embark on a five-year, $25 million research program to show that phones are safe.

It is not clear who was more worried: The public over cancer risks or the stockholders over the risk of lost investments due to public boycotts. As it turned out, Wall Street had little to fear. The furor soon passed and the mobile phone industry went on to become a huge success. Today over 90 million Americans use cellular phones, compared to about 11 million at the end of 1992. The industry is marketing phones to children and is encouraging people to go totally wireless by giving up their regular home phones in favor of cellular phones.

*) Original paper
As the health issue subsided, so did pressure to actually do any research. The Cellular Telecommunications Industry Association (CTIA) quickly dropped plans to have the Food and Drug Administration (FDA) run its research program and instead turned to Dr. George Carlo, who had helped manage the dioxin problem for the chlorine and paper industries in the past. Over the next six years, Carlo’s group, Wireless Technology Research (WTR), organized many meetings and published many reports but sponsored only a handful of scientific studies.

Few outsiders applied any pressure on the industry to make good on their promises to do research. No one in the Congress asked the FDA to intervene—and the FDA had little interest in doing anything on its own. As a result, CTIA and Carlo’s WTR carried on as they pleased.

Somewhat paradoxically, the only organization that appeared to have any apprehension over the industry’s lack of progress was Motorola. Although the company was contributing to the CTIA effort, it embarked on its own multimillion dollar research program. The company had bet its future on wireless communications and hoped to insure itself in case there did turn out to be some health risks.

The Motorola research program has been many times more productive than that of CTIA and WTR. Last year, at a workshop to review the result of the industry research at the close of the WTR program, the majority of the speakers were sponsored by Motorola. Without them, it would have been a very short meeting!

The media, especially newspapers, have also been apathetic and have devoted very little space to the issue. (By comparison, newspaper coverage has been much more extensive in the U.K.) For instance, in the U.S. only two local newspapers covered the 1997 Australian study showing a doubling of lymphoma rates among mice exposed to GSM radiation. The result, of course, was that most people never heard the news.

Carlo’s program came to an end when CTIA refused to extend WTR’s funding. At that point, Carlo changed his outlook and began to proclaim that there were indeed health risks from mobile phones and that the public needed to be warned and protected. This did prompt a rash of stories but they were as much about Carlo biting the hand that used to feed him as about phone health risks.

Today, virtually no research on microwave radiation from cell phones is going on in the U.S. The CTIA promised to follow up some of Carlo’s results last October when a popular TV news magazine show (ABC’s 20/20) might have catalyzed some concern. But those plans languished when popular pressure failed to materialize. The Motorola program has also slowed and the government continues to watch from the sidelines.

**A Short History of the Tower Controversy**

The tower controversy is a manifestation of the NIMBY syndrome—not in my backyard. After all, communication towers are the smokestacks of the information age.

Fights over the location of mobile phone towers are an extension of similar siting battles over microwave relay stations during the 1980s. The key difference is one of scale. Over 100,000 towers have been built in the U.S. and the construction boom is not over. Essentially every community across the country has grappled with this issue.

The siting battles escalated to the point that in 1996 the Congress, on the prodding of the telecom industry, passed a law that prevented state and local governments from mandating RF/MW health exposure standards that are more stringent than those adopted by the Federal Communications Commission (FCC). The FCC relied on the limits set by the National Council on Radiation Protection and Measurements and by the American National Standards Institute, both of which are based on thermal effects of the radiation. No tower could fail to meet these limits (except perhaps with respect to occupational exposures).
While the law sped up tower siting, communities with financial resources have continued the fight. One notable example is the town of Medina in the state of Washington, where Bill Gates and other Microsoft millionaires had homes. Medina enacted a moratorium five days after Bill Clinton signed the new law and, although the phone company took them to court, the town won and a tower was never built in Medina.

The fiercest battles over mobile phone towers have been waged over the placement of antennas next to schools and playgrounds. Some school boards, which are usually short of money, have been quick to agree to the towers because of the lucrative contracts offered by the companies. As early as 1995, the California Public Utilities Commission urged cellular phone companies to avoid building their towers next to schools. The commission based its recommendation more on prudent avoidance and public perception of the radiation risks than on any proven hazard.

Tower activists have succeeded in getting their message heard by Congress. While legislative proposals have been introduced in the U.S. Senate to change the planning process for the siting of towers, there have been only lukewarm efforts to increase funding for cell phone radiation research. It is worth pointing out that a bill introduced by Senator Patrick Leahy of Vermont suggests that the use of more powerful satellite phones may be preferable to the construction of new towers.

The fights go on and there appears to be no end in sight. Small local groups of activists quickly spring up in reaction to word of a new tower and just as quickly disband when the battle is won or lost.

The single most important development that transcends the placement of a particular tower has been the legal challenge to the adequacy of the national exposure standards adopted by the FCC. So far, the government has won and the final appeal is now before the Supreme Court.

**Comparing Phone and Tower Risks**

At least some of the apparent inconsistencies in public reactions to these two sources of radiation may be attributed to the differences in perceived risk for voluntary and involuntary risks, a distinction first made by Chauncey Starr more than 30 years ago (Science, 165, p.1232, 1969). After all, the user of the phone chooses to be exposed to radiation, unlike perhaps those who live, work or go to school next to a mobile phone tower.

And clearly, Americans, like others all over the world, love their phones! This adds great weight to the benefit side of the risk/benefit equation and discourages many from challenging the status quo. In fact, one is tempted to conclude that phone users do not really want to know if their phones present a health risk.

Compare, for instance, the hot issue of locating towers next to schools and playgrounds to the lack of parental reaction to the marketing of phones to children—indeed many parents are happy to buy phones for their kids.

The level of concern over mobile phone towers is far greater than that for the much more powerful antennas for transmitting radio and television signals. Although there are far fewer of these towers, there are still many more than 10,000 in the U.S. Except for the efforts of active community groups in Denver (Lookout Mountain) and San Francisco (Mount Sutro), there are few links between cell phone and broadcast radiation activists.

Of course, the greatest irony comes from the fact that if the public did not love their phones so much, there would be many fewer towers. The proliferation of towers is a direct result of the demand for dial tones on mobile phones. And given that there will soon be 100 million mobile phone users, many of those who oppose towers must also be users of hand-held phones.
The lack of shared goals among those concerned with phones and those concerned with towers leads to the conclusion that these are two very distinct issues in the U.S. with very little in common.

Although tower activists are quick to voice their worries over radiation from mobile communication towers, the opposition to towers often has more to do with community issues such as aesthetics, property values and local control of zoning than with overexposure to radiation.

Let me be clear: There are legitimate concerns over the lack of long-term studies of chronic, low-level exposures, especially since towers entail round-the-clock exposures. On the basis of a precautionary approach, banning the siting of cellular towers next to schools is a good idea, as is a policy of minimum distances between antennas and residences. After all, a number of studies point to health risks at low doses, and industry has done much too little to show the safety of long-term exposures. At this time, no one can dismiss these risks as implausible.

Public exposures to microwave radiation will only increase in the years ahead. Soon we will all be exposed from phones and towers as well as many other sources. Without a unified effort, we will not know if there are health impacts.