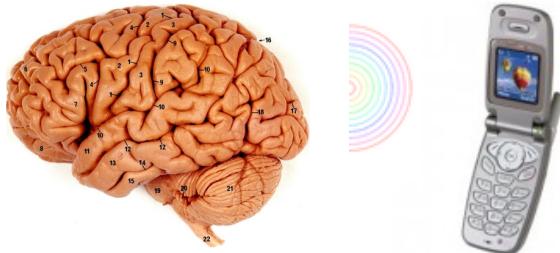


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## Ceiling Fear The Cell Phone Scare that Refuses to Die

By Michael Fumento\*

Soon would-be cell phone buyers in Maine might be checking out the latest models, only to find a jarring red box on each unit with the image of a brain next to a phone.<sup>1</sup> On it, the alarming words:

WARNING, THIS DEVICE EMITS ELECTROMAGNETIC RADIATION;  
EXPOSURE TO WHICH MAY CAUSE BRAIN CANCER. USERS, ESPECIALLY  
CHILDREN AND PREGNANT WOMEN, SHOULD KEEP THIS DEVICE AWAY  
FROM THE HEAD AND BODY.<sup>2</sup>

The above notice would be mandated by Maine's Children's Wireless Protection Act, which was recently introduced as emergency legislation following a unanimous vote by the state's legislative council.<sup>3</sup> Does this mean science shows that cell phones really are harmful? On the contrary. The real problem comes from misinformation from activists and a policy called "the precautionary principle" that could be devastating if it makes inroads into public policy.

Unfortunately, the Maine legislature is not the only government body considering such a hysterical action. This month, the San Francisco Board of Supervisors is expected to consider a resolution already approved unanimously by a commission as well as by the mayor.<sup>4</sup> Among other things, it requires radiofrequency emission levels for each phone to be displayed as large as the price and asks for "warning labels [to] be placed on all cell phone packaging regarding exposure to radiation, especially for children."<sup>5</sup>

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The idea, says San Francisco Toxics Reduction Program Manager Debbie Raphael, is that since the city cannot require manufacturers to redesign phones, requiring a label presumably warning of health risks will influence them to redesign their products. However, there is no call to require the same labels on other radiofrequency emitting devices, such as televisions and personal computers.

**Sensationalism Drives the Scare.** Science has always taken a back seat to sensationalism in the cell-phone cancer scare. It began in 1993, when a guest on Larry King's show asserted that his pregnant wife had gotten a fatal brain tumor from a cell phone, basing this on no more evidence than her having used the phone three months before the tumor was detected.<sup>6</sup> Never mind that brain cancers take years to manifest.<sup>7</sup> The media ran with it and it became the ship that launched a thousand studies—studies in turn selectively transmitted and interpreted by the same sensationalist media.

But on what evidence is this alleged danger of radiofrequency exposure based? When Maine Democratic Assemblywoman Andrea Boland, who introduced the legislation, was asked precisely that on Larry Kudlow's CNBC show in December, she replied, "I was relying on evidence from experts in the field."<sup>8</sup> She then waved and recommended a document titled, "Cell Phones and Brain Tumors: 15 Reasons for Concern."

The primary author of that paper was one of her two fellow panelists, Lloyd Morgan.<sup>9</sup> Media reports said it was published "by International EMF Collaborative, a peer-reviewed journal."<sup>10</sup> But Morgan told me it was unpublished and the "collaborative" comprised four Americans and four Britons. And while Morgan was identified as being "with" the respected Central Brain Tumor Registry of the U.S., he is actually not a researcher with them. Rather, he is a member of the CBTRUS board of directors, with his affiliation listed as "Patient Advocate."<sup>11</sup> Morgan twice stated on Kudlow's show, "Every study that's looked at brain tumors for more than 10 years all find a statistical significant risk for brain tumors." Boland said the same to me.

Yet the day before, a much-circulated Associated Press article claimed that there had been "no long-term studies on cell phones and cancer."<sup>12</sup> So which is it: Do the long-term studies all show a risk or are there no long-term studies? The answer is: Neither.

**The Scientific Evidence.** A number of research reports in the medical literature that have looked at over a decade of cell phone exposure have found the devices to be safe. One such paper from 2008, a five-nation study in the *International Journal of Epidemiology* declared, "Regular mobile phone use was associated with an apparently reduced risk of meningioma," a type of brain tumor that can be either cancerous or benign.<sup>13</sup> Morgan clearly knows about the study—he submitted a response in that same journal challenging it.<sup>14</sup>

Another such study appeared in December just before the AP story ran and Kudlow's show aired. Published in the prestigious *Journal of the National Cancer Institute*, it involved essentially the entire adult populations of all four Scandinavian countries, 16 million people total. Scandinavia is the best place for such studies because it has had mobile phone networks since 1991—two years before the U.S. Since the data collection cut-off was 2003, that makes it a

12-year evaluation. It found no excess of brain tumors among cell phone users and added that if cell phones did cause tumors enough time had elapsed for them to start showing up.<sup>15</sup>

Dr. Robert Hoover, director of the Epidemiology and Biostatistics Program at the National Cancer Institute, agrees, saying, “One would expect to have seen an increase in incidence by now.” Morgan, who told me he began his odyssey after being diagnosed with a massive brain tumor in 1995 and being told by his physician that the cause was “possibly electromagnetic fields,” disagrees, saying it takes about 30 years for brain tumors to develop. “That study stopped at 2003 and you have to ask how many people were exposed to cell phones 30 years before 2003.” The study’s purpose was not science in my humble opinion,” he says. “Its purpose was to get the headlines it got.”

Asserting that the study did not cover a long enough period to show harmful effects is not the same as saying that it affirmatively showed harm, as Morgan suggests with his insistence, parroted by Boland, that “Every study that’s looked at brain tumors for more than 10 years all find a statistical significant risk for brain tumors.” In any case, he is confusing an *average* of 30 years with an *absolute* period of 30 years. As David Savitz, director of the Disease Prevention and Public Health Institute at New York’s Mt. Sinai Hospital, explains, “Even for asbestos with an average latency period of 15 to 20 years you can find excess cancers as early as five years after the exposure.” Twelve years is enough.

Morgan also takes the convenient if illogical view that excess brain tumors caused by cell phones can show up in the studies he does cite, while lack of excess tumors over the same or longer periods is meaningless. “That’s what I consider the amazing alarming bell!” he exclaims. Still, Morgan is passionate in his cause warning of a “coming pandemic of brain tumors” and saying he expects perhaps 200 million deaths.

Savitz considers the Scandinavian study to be excellent. “Because we have this agent [cell phones] introduced so quickly and pervasively it gives you chance to see if there’s any discernible effect of exposure” across the population as a whole. Further, “It doesn’t depend on recall or participation; it’s simple monitoring.” In epidemiology, simpler is always better because it means you do not have to worry about trying to factor out pesky variables.

One powerful aspect of the study is that unlike so many others it does not suffer what is known as “recall bias”—asking people how long they talked on their cell phones many years ago when they often cannot even remember how long they used them last week. Studies relying on recall, Hoover says, are likely to falsely indicate harmful results because people know the context in which the question is being asked and will subconsciously link usage to harm. That is especially true, he says, with studies asking on which side of the head people tended to hold their phones and comparing it to where the tumor developed.

Savitz himself co-authored another long-term study, this one actually a review of the entire body of research, which appeared in the September 2009 issue of *Epidemiology*.<sup>16</sup> “We made it an explicit goal to use the best information available,” he says. “We just didn’t see affirmative evidence that there is a hazard.”

The single largest body of research on the potential health hazards of cell phones is a collaborative project from 13 different countries, collectively known as Interphone.<sup>17</sup> So far, it has spun off 16 studies, with a comprehensive study supposedly soon to be published under the auspices of the World Health Organization.<sup>18</sup> And even though the work suffers from recall bias—which would tend to push the findings towards showing cell phone hazards—their “dominant finding,” as Morgan’s own paper concedes, is that cell phones are harmless. Indeed, the stated purpose of his paper is to refute the Interphone conclusions.

**Women and Children First!** What of the alleged special cancer threat to children and pregnant women? The claims of danger to children are all based on theory—essentially that thinner skulls and developing brains are more vulnerable. It’s true that the skull continues to thicken until about age 20,<sup>19</sup> but there’s no indication that the thickness of the skull matters at all. Of the research, says Savitz, “Epidemiology does not do much if anything to support focus on kids with respect to anything, whether cancer or attention deficit or development problems.”

Regarding pregnant women, there was indeed a study published in the July 2008 *Epidemiology* in which UCLA researchers recruited Danish mothers and asked them about their mobile phone usage during pregnancy.<sup>20</sup> It concluded that the mother’s exposure while pregnant was “associated with behavioral difficulties such as emotional and hyperactivity problems” in their offspring, while adding “these associations may be noncausal.” Again, though, we see the potential effect of recall bias. The women were asked about their cell phone usage from seven years earlier. The ones with the more hyperactive children would be more likely to overstate their exposure.

Savitz, as editor of the article, had concerns about the publication of the study and indeed accompanied it with a commentary that in the title referred to “Inflammatory Epidemiology.” “I recognized the study was raw material to those wanting to build a case” against cell phones, he says, even though there is “no biological explanation for how a pregnant woman’s cell phone usage could produce children prone to hyperactivity.” Still, “We didn’t want to be in position of saying it doesn’t make sense therefore it must be wrong.” So the journal published it.

**The Hardell Effect.** Nevertheless, much of the long-term research that concludes that cell phones cause various types of harm in humans can be explained by the recall bias to which such studies are prone. And a large and influential body of such recall-bias tainted research showing cell phone hazards has poured forth from a single source, Swedish oncologist Lennart Hardell. Hardell has at least 26 citations in the Medline database of medical and science journals dating from 2000 involving cell phone safety. Lloyd Morgan’s paper cites 16 of them. The only cell phone “expert” besides Morgan that Maine’s Boland named to me is environmental activist Devra Lee Davis, best known for her insistence that most cancer is man-made.<sup>21</sup> She has one cell phone paper to her name.<sup>22</sup> Davis in turn credits Hardell with getting her involved in the cell phone issue.<sup>23</sup>

Hardell’s impact on the body of published cell phone medical literature is so striking that the 2009 *Epidemiology* review of the literature co-authored by Savitz repeatedly declares that

“except for” studies by Hardell, no evidence of harm was evident in the literature. Indeed, it even ran two sets of graphs in which Hardell’s work was either included or excluded to show the difference on cell phone study findings as a whole. “The only consistently reported indication of risk comes from Hardell” and his people, says Savitz. “It is worrisome when one group consistently finds something and others can’t replicate it,” he adds. “It’s not saying someone is being dishonest or willfully misrepresenting something but rather” shows some difference in “how they analyze and present the data.”

The review studies implicating cell phones as tumor-causing could not do it without Hardell. Consider a November 2009 Journal of Clinical Oncology review of 23 cell phone studies.<sup>24</sup> The lead author Joel Moskowitz has no background in either epidemiology or oncology, but rather is a psychologist at the University of California, Berkeley. And once again, the studies were based on recall. Still, when all were combined they found no causal relationship between cell phone use and cancer incidence. Even though they had already culled the 23 studies from an initial 465, by emphasizing what they considered the eight best studies, Moskowitz and his colleagues concluded that cell phones appear to cause cancer. Of those eight, Hardell authored seven.

Hardell’s impact also has rippled throughout the popular media. In 2008, for example, Fox News ran a short piece that claimed that a new “study” shows that “cell phone use could kill more people than smoking.”<sup>25</sup> It was based entirely on an equally alarmist article in a British tabloid.<sup>26</sup> At least the tabloid acknowledged that the work had not been published, but merely appeared on a website. When it finally was published it proved to be yet another Hardell paper—and yet another study relying on recall.<sup>27</sup>

This is the essential pattern of media cell phone coverage: Published studies with negative findings are simply ignored, as the December AP story illustrates, while unpublished ones indicating harm receive banner headlines. “It’s frustrating that people will pick up on the sensational rather than the mundane,” says Savitz.

**The Precautionary Principle.** Hardell clearly revealed his prejudices in one of the first cell phone pieces he published, a 2000 commentary calling for application of “the precautionary principle.”<sup>28</sup> This is not a scientific rule, but rather an expression of public policy with no set wording.<sup>29</sup> And it has been used in such a way that old risks tend to be grandfathered in while newer ones become excruciatingly analyzed. The principle is based on the impossible, unscientific requirement of having to prove a negative—to ascertain that a new product carries no risk of ever causing any harm before being allowed into commerce.

San Francisco’s resolution expressly says it is guided by the precautionary principle, which it officially adopted as a policy in 2003. Boland told me that it also guided her bill.<sup>30</sup> San Francisco also cites as support regulations from several European nations recommending limiting cell phone exposure that have expressly adapted the precautionary principle.<sup>31,32</sup> “We don’t think the precautionary principle means zero risk,” says San Francisco’s Raphael. “It means looking at the science and all the alternatives and choosing that which minimizes harm even in face of lack of proof of cause of effect.”

On its face that sounds reasonable, but in practice it is anything but. As Julian Morris, director of the London-based International Policy Network explains, what they are really saying is essentially that, “if a technology *might* cause harm, that technology should not be used” or should be restricted. It also lends itself to imposing impossible standards. “Negatives cannot be proved. So, it is always possible to say that something *might* happen, no matter how improbable.” Were the principle widely applied, says Morris, “all innovation, and hence all human progress, would stop.”

The principle is also applied arbitrarily. During the many years when silicone breast implants were banned in the United States, they remained legal in Europe.<sup>33</sup> Likewise in 2006, San Francisco banned the plastic ingredient bisphenol A (though it repealed the ban the next year),<sup>34</sup> even though European bodies have repeatedly affirmed the product’s safety.<sup>35</sup> The precautionary principle has conveniently allowed San Francisco regulators to pick and choose which nations to cite for authority.

**Filtered Research, Rewritten Research.** Aside from arbitrary application of precaution, how do government bodies decide when people must be warned of potential alleged dangers—for cell phones or anything else? You choose your outcome by choosing your scientific advisors. Boland cites two activists as her sources, the aforementioned Lloyd Morgan and Devra Lee Davis.

Likewise, San Francisco used two activists, albeit different ones. According to Debbie Raphael, one was the aforementioned Berkeley psychologist Joel Moskowitz, whose statements to the media put him squarely in the activist camp.<sup>36</sup> “Clearly there is risk,” he told *HealthDay News* in October, adding that without “a whole lot more research” it is “derelict of us as a society or as a planet to just disseminate this technology to the extent that we have.”<sup>37</sup> These are hardly the tempered words of an unbiased professional.

The other was Olga Naidenko, lead author of a paper produced by the far-left Environmental Working Group (EWG). Yet merely a quick reading of the EWG paper reveals what’s hard to dismiss as anything short of fraud. It dismisses the *Epidemiology* review from September 2009 as being among “earlier, short-term studies,”<sup>38</sup> yet goes on to cite papers that are *four years older* in support of its position. Worse, both of those 2005 studies, one in the *American Journal of Epidemiology* and another in the *British Journal of Cancer* found, as one put it, “the data do not support the hypothesis that mobile phone use is related to an increased risk” of brain tumors.<sup>39,40</sup>

Moreover, the activists cannot even agree with each other. Even as Lloyd Morgan attacks the Interphone studies because they *do not* show harmful effects, the EWG insists this same body of work raises “serious issues about the cancer risk of cell phone use.”

**Conclusion.** Mt. Sinai’s David Savitz says it is natural for people to be concerned about electronic gadgets which they routinely hold up to their heads and it is a good thing that a lot of research has been done. But, he adds, “I think slowly the fear will dissipate and we’ll move on fairly rationally. We acclimate to the evidence.”

In the meantime, though, irrationality rears its ugly head, as proponents of the pernicious precautionary principle are constantly on the prowl for any issue in any jurisdiction where they can get their foot in the door. If they succeed in San Francisco or Maine, they could do a lot of harm. Savitz cites another important concern as well. “This just adds to the noise” of all the health warnings we receive, he says. “I worry about squandering our public health message” and thereby “reducing the credibility of messages that deserve to be heeded.” It is, he says, “a downside to crying wolf.”

## Notes

<sup>1</sup> Glenn Adams, “Maine to Consider Cell Phone Cancer Warning,” ABCNews.com (Associated Press), December 21, 2009, <http://abcnews.go.com/Technology/wirestory?id=9390340&page=1>.

<sup>2</sup> “An Act to Create the Children’s Wireless Protection Act,” HP 1207, LD 1706, item 1, 124<sup>th</sup> Maine State Legislature, [http://www.mainelegislature.org/legis/bills/bills\\_124th/billpdfs/HP120701.pdf](http://www.mainelegislature.org/legis/bills/bills_124th/billpdfs/HP120701.pdf). This is an exact quote. The draft legislation calls for the warning to be written in all-caps.

<sup>3</sup> “Maine to Vote on Health Warnings for Cell Phones and Cell Phone Packaging,” ElectromagneticHealth.org, December 12, 2009, <http://electromagnetichealth.org/electromagnetic-health-blog/maine-to-vote-on-health-warnings-for-cell-phones-and-cell-phone-packaging/>.

<sup>4</sup> “Resolution recommending measures for educating the public on and reducing exposure to 3 radiation from cell phones, including disclosure of radiation information at point of sale,” draft, San Francisco Board of Supervisors, [http://www.fumento.com/fumento/San\\_Fran\\_Cell\\_Phone\\_Resolution.pdf](http://www.fumento.com/fumento/San_Fran_Cell_Phone_Resolution.pdf).

<sup>5</sup> Ibid.

<sup>6</sup> Michael Fumento, “Do Cellular Phones Really Kill?” *Investor’s Business Daily*, February 16, 1993, <http://www.fumento.com/ibdcell.html>.

<sup>7</sup> It’s common to read simple assertions that brain tumors take “20 years” or “30 years” to develop. That already confuses average time with absolute time, studies of individuals exposed to ionizing radiation for primary brain tumor, ring worm (*tinea capitis*), exposure to dental x-rays, and exposure to atomic explosions in Hiroshima and Nagasaki show tremendous disparity even in terms of average. One recent review in the journal *Neurosurgical Focus* noted, “The latency period between exposure and clinical diagnosis of meningioma varies with radiation dose and age at initial treatment” (Felix Umansky, M.D., et al., “Radiation-Induced Meningioma: Clinical Presentation,” *Neurosurgical Focus* Vol. 24 No. 5, 2008). It observed that an Israeli low-dose study “reported a 36.3-year average latency (range 12-49 years),” while “in a thorough review of the literature” other researchers “calculated that a mean of 35.2 years elapsed between low-dose irradiation and diagnosis, whereas a mean of 26.1 and 19.5 years, respectively, elapsed in patients receiving moderate and high-dose treatment.” Another survey of persons reported exposed to high-dose radiation “observed average latency of 18.7 years and also noted shorter latency in patients in whom radiation treatments were administered at younger ages.” Yet another study, according to the *Neurological Focus* paper, found a mean latency of only 10.8 years (range 5-15.5) in a study of 13 pediatric high-dose radiation-induced meningioma patients with mean age at diagnosis 13 years.

Gliomas, which can be malignant or benign but comprise three-fourths of brain cancer cases, have been associated with ionizing radiation exposure but identified cases are extremely rare (Gautam Prasad and Daphne A. Haas-Kogan, “Review: Radiation-induced gliomas,” *Expert Review of Neurotherapeutics* Vol. 9 No. 10, October 2009, pp. 1511-1517). One review of 10 cases found a mean latency of 9.6 years (M. Salvati, et al., “Radiation-induced gliomas: report of 10 cases and review of the literature,” *Surgical Neurology* Vol. 60 No. 1, July 2003, pp. 60-67.) while another of 13 cases calculated a mean latency of 10.7 years (M. Kranzinger, et al., “Malignant glioma as a secondary malignant neoplasm after radiation therapy for craniopharyngioma: report of a case and review of reported cases,” *Onkologie* Vol. 24 No. 1, February 2001, pp. 66-72.).

Thus, generalities like 20 years or 30 years aren’t very useful, though they do allow us to say that with certainty that the wife of the Larry King show guest couldn’t have gotten her tumor from a cell phone. Moreover, averages are just that. In reality, cases will be spread across what is called a Poisson distribution. They will appear long before the average time and long after. The larger the study, the earlier and later it will find cases and the greater will be the statistical significance of those findings. Thus while the aforementioned Israeli study found no tumors with a latency of less than 12 years, it also only looked at 253 cases (S. Sadetzki, et al., “Radiation-induced

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meningioma: a descriptive study of 253 cases," *Journal of Neurosurgery* Vol. 97 No. 5, November 2002, pp. 1078-1082.). By contrast, the trans-Scandinavia *International Journal of Epidemiology* study drew from a base of 16 million people and 60,000 meningiomas and gliomas, giving it far greater power to detect tumors much earlier.

<sup>8</sup> *Cell Phone Brain Cancer?* "The Kudlow Report," CNBC,  
<http://www.cnbc.com/id/15840232?video=1366621223&play=1>.

<sup>9</sup> "Cell Phones and Brain Tumors: 15 Reasons for Concern," *The Radiation Research Trust*, August 25, 2009,  
[http://www.radiationresearch.org/pdfs/reasons\\_us.pdf](http://www.radiationresearch.org/pdfs/reasons_us.pdf).

<sup>10</sup> Bethany Jones, "Some scientists link cell phone use to brain cancer," *Columbian Missourian*, December 27, 2009,  
<http://www.columbiamissourian.com/stories/2009/12/27/cell-phones-may-cause-brain-tumors/>.

<sup>11</sup> "CBTRUS – Board of Directors," Central Brain Tumor Registry of the United States website,  
<http://www.cbtrus.org/board/board.html>.

<sup>12</sup> Glenn Adams.

<sup>13</sup> A. Lakhola, et al., "Meningioma and mobile phone use—a collaborative case-control study in five North European countries," *International Journal of Epidemiology* Vol. 37 No. 6, December 2008,  
<http://ije.oxfordjournals.org/cgi/content/full/37/6/1304>.

<sup>14</sup> Lloyd Morgan, "Reader's Response: Meningioma and mobile phone use--a collaborative case-control study in five North European countries," *International Journal of Epidemiology*, Letter to the Editor, April 22, 2009,  
<http://ije.oxfordjournals.org/cgi/content/full/dyp197>.

<sup>15</sup> I. Deltour, et al., "Time trends in brain tumor incidence rates in Denmark, Finland, Norway, and Sweden, 1974-2003," *Journal of the National Cancer Institute* Vol. 101 No. 4, December 16, 2009, pp. 1721-1724.

<sup>16</sup> David A. Savitz, et al., "Epidemiologic evidence on mobile phones and tumor risk: a review," *Epidemiology* Vol. 20 No. 5, September 2009, pp. 639-652.

<sup>17</sup> RFcom, "Research Program—Interphone Study," University of Ottawa McLaughlin Centre for Population Health Risk Assessment, <http://www.rfcom.ca/programs/interphone.shtml>.

<sup>18</sup> Michael Repacholi, "Cellphones and cancer: Interphone can't end the debate," *New Scientist*, December 9, 2009,  
<http://www.newscientist.com/article/mg20427380.100-cellphones-and-cancer-interphone-cant-end-the-debate.html>.

<sup>19</sup> Adelola Adeloye, Kenneth R. Kattan, and Frederic N. Silverman, "Thickness of the normal skull in the American blacks and whites," *American Journal of Physical Anthropology* Vol. 43 No. 1, July 1975, pp. 23-30.

<sup>20</sup> H.A. Divan, et al., "Prenatal and postnatal exposure to cell phone use and behavioral problems in children," *Epidemiology* Vol. 19 No. 4, July 2008, pp. 523-9.

<sup>21</sup> Devra Lee Davis, "Most Cancer Is Made, Not Born," *San Francisco Chronicle*, August 10, 2000,  
<http://www.ourstolenfuture.org/commentary/Opinion/20000810davis.htm>.

<sup>22</sup> D.L. Davis, et al., "Cell phone use and acoustic neuroma: the need for standardized questionnaires and access to industry data," *Surgical Neurology* Vol. 72 No. 3, September 2009, pp. 216-222.

<sup>23</sup> Devra L. Davis, "Why I Am Concerned about Cell Phones," *The Networker* Vol. 14 No. 5, October/November 2009, [http://www.sehn.org/Volume\\_14-5.html#a2](http://www.sehn.org/Volume_14-5.html#a2).

<sup>24</sup> Joel M. Moskowitz, et al., "Mobile Phone Use and Risk of Tumors: A Meta-Analysis," *Journal of Clinical Oncology* Vol. 27 No. 33, November 20, 2009, pp. 5565-5572.

<sup>25</sup> "Study: Cell Phones Could Be More Dangerous Than Cigarettes," FoxNews.com, March 31, 2008,  
<http://www.foxnews.com/story/0.2933.343335.00.html>.

<sup>26</sup> Geoffrey Lean, "Mobile phones 'more dangerous than smoking,'" *The Independent*, March 30, 2008,  
<http://www.independent.co.uk/life-style/health-and-families/health-news/mobile-phones-more-dangerous-than-smoking-802602.html>.

<sup>27</sup> L. Hardell, et al., "Cell phones and brain tumors: a review including the long-term epidemiologic data," *Surgical Neurology* Vol. 72 No. 3, September 2009, pp. 205-214.

<sup>28</sup> L. Hardell, et al., "[Mobile telephones and the risk of brain tumor—the principle of precaution should be practiced]," article in Swedish, *Lakartidningen* Vol. 97 No. 36, September 6, 2000, pp. 3908-3909.

<sup>29</sup> Cass R. Sunstein, "The Paralyzing Principle," *Regulation*, Winter 2002-2003, Washington, D.C.: Cato Institute, pp. 32-37, <http://www.cato.org/pubs/regulation/regv25n4/v25n4-9.pdf>.

<sup>30</sup> Sepp Hasslberger, "San Francisco adopts precautionary principle," Networking For A Better Future, June 29, 2003, [http://www.communicationagents.com/sepp/2003/06/29/san\\_francisco\\_adopts\\_precautionary\\_principle.htm](http://www.communicationagents.com/sepp/2003/06/29/san_francisco_adopts_precautionary_principle.htm).

<sup>31</sup> Cancer Research UK, "Do mobile phones cause cancer?" <http://scienceblog.cancerresearchuk.org/2008/07/25/do-mobile-phones-cause-cancer/>.

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<sup>32</sup> “The precautionary principle,” Summaries of EU legislation, Europa, November 2, 2005, [http://europa.eu/legislation\\_summaries/consumers/consumer\\_safety/l32042\\_en.htm](http://europa.eu/legislation_summaries/consumers/consumer_safety/l32042_en.htm).

<sup>33</sup> Michael Fumento, “A Confederacy of Boobs,” *Reason*, October 1995, <http://www.fumento.com/boobs.html>.

<sup>34</sup> “City of San Francisco Repeals Ban on Bisphenol A in Children’s Products,” Bisphenol-A.org, May 29, 2007, <http://www.bisphenol-a.org/whatsNew/20070531SanFranciscoRepeal.html>.

<sup>35</sup> “EFSA updates advice on bisphenol,” European Food Safety Authority press release, July 23, 2008, [http://www.efsa.europa.eu/EFSA/efsa\\_locale-1178620753812\\_1211902017373.htm](http://www.efsa.europa.eu/EFSA/efsa_locale-1178620753812_1211902017373.htm).

<sup>36</sup> Amanda Gardner, “Study Suggests Link Between Cell Phones and Brain Tumors,” *HealthDay*, October 13, 2009, <http://www.healthfinder.gov/news/newsstory.aspx?docid=631915>.

<sup>37</sup> Ibid.

<sup>38</sup> Environmental Working Group, “Cell Phone Radiation Science Review,” Environmental Working Group website, <http://www.ewg.org/cellphoneradiation/Health-problems>.

<sup>39</sup> Stefan Lönn, et al., “Long-Term Mobile Phone Use and Brain Tumor Risk,” *American Journal of Epidemiology* Vol. 161 No. 5, March 2005, pp. 526-535.

<sup>40</sup> M.J. Schoemaker, et al., “Mobile phone use and risk of acoustic neuroma: results of the Interphone case-control study in five North European countries,” *British Journal of Cancer* Vol. 93 No. 7, October 2005, pp. 842-848.