WHO Classification Sparks Debate Over Cell Phone Safety

By Judy Peres

F ar from settling the question of whether cell phones cause cancer, the latest pronouncement by the World Health Organization that cell phones could “possibly” be carcinogenic has left a wake of confusion and consternation.

In July’s The Lancet Oncology, the WHO’s International Agency for Research on Cancer (IARC) announced that it had classified radiofrequency (RF) electromagnetic fields—such as those that wireless phones emit—as “possibly carcinogenic to humans” based on an increased risk of glioma and acoustic neuroma. The move came barely a year after the huge Interphone study found no increased risk of cancer from more than 10 years of cell phone use. But the Interphone results, published here in the Journal (see J. Natl. Cancer Inst. 2010; 102:13), suggested there might be some risk for people with the heaviest use.

The National Cancer Institute, the American Cancer Society, and other organizations were at pains to update their online information and reassure worried consumers that the WHO action was not based on any clinically meaningful new evidence but merely on an evaluation of the existing literature. Experts repeated the familiar mantra “more research is needed,” even as newspaper headlines warned of the potential risk.

Some observers missed the small print. The IARC’s 2B classification—“possibly carcinogenic to humans”—was based only on “limited evidence of carcinogenicity.” According to IARC, that means: “A positive association has been observed between exposure to the agent and cancer for which a causal interpretation is considered . . . to be credible, but chance, bias, or confounding could not be ruled out with reasonable confidence.”

As Jonathan Samet, M.D., overall chair of the IARC working group and chair of preventive medicine at the University of Southern California, told a press conference in Lyon, France, on May 31, the classification means “there could be some risk, and therefore we need to keep a close watch for a link between cell phones and cancer risk.”

What the WHO Label Means

The WHO’s announcement followed a meeting in May of the IARC working group, which consisted of 31 scientists from 14 countries. According to The Lancet Oncology, “a few members of the Working Group considered the current evidence [of carcinogenicity] in humans ‘inadequate,’” but “a large majority” supported the final conclusion. The complete assessment, which is expected to include a minority report, will appear in volume 102 of the IARC Monographs.

Since 1971, the IARC Monographs have evaluated more than 900 agents, approximately 400 of which have been identified as carcinogenic (group 1) or potentially carcinogenic (group 2) to humans. Group 1 now contains 107 agents, including asbestos and benzene; Group 2A (probably carcinogenic) contains 59 agents, including creosotes and diesel engine exhaust; and Group 2B (possibly carcinogenic) contains 267 agents, including coffee, talcum powder and pickled vegetables. Group 3 (not classifiable, mainly because of inadequate evidence) has 508 agents, and Group 4 (probably not carcinogenic to humans) has only one, caprolactam.

But most people are not familiar with the WHO’s labels. And the disconnect between the labels and public interpretation of them is responsible for much of the confusion, according to Bob Tarone, Ph.D., biostatistics director of the International Epidemiology Institute in Rockville, Md. “In my opinion, most of the agents in categories 2B and 3 probably don’t cause cancer, as most people understand the definition of ‘probably.’ But the IARC criterion for Group 4, probably not carcinogenic, is virtually impossible to meet, since you need evidence for the lack of carcinogenicity of the agent.”

Meanwhile, the IARC’s nuanced language has enabled various interpretations and fueled both advocates and skeptics of the possible risk. Lennart Hardell, M.D., Ph.D., a cancer researcher at Orebro University Hospital in Sweden, appeared to consider the IARC action a vindication of his own studies, which have consistently found increased risks of brain cancer from cell phone use, especially on the side of the head where the phone is usually held. “Definitely, this is a change of concept,” he said. “Wireless phones are not safe to use. We need to rethink the use of this technology. My view is that we should provide people with land lines.”

Other scientists are less declarative of what to do, but say that governments need to step in to the debate. Joel Moskowitz, Ph.D., director of the Center for Family and Community Health at the University of California-Berkeley, accused the U.S. government of being in denial about the potential health risks of cell phones. “We have 300 million cell phones in use in the United States and nearly 5 billion worldwide,” he said. “Everyone is exposed. We need a massive research enterprise, and we need to train researchers who can do this, because it’s very complicated.”

Israel’s Ministry of Health has already published a set of guidelines aimed at educating the public about how to use cell phones safely, said Siegal Sadetski, M.D., of...
the Gertner Institute at Sheba Medical Center near Tel Aviv. Sadetzki, who headed the Israeli Interphone study, added, “Considering the enormous number of users and the fact that the precautionary principle is so easy to implement in this case, if it’s a possible carcinogen, there’s no doubt—not even the tiniest doubt—that we must take action to protect public health.”

**Skeptics Call Studies Insufficient**

However, for Maria Feychting, Ph.D., a professor of epidemiology at the Karolinska Institute in Stockholm, “Nothing has changed.” She would have voted with the minority on the IARC working group and put cell phones in group 3 (insufficient evidence). Among other reasons, she believes the Hardell results are not plausible and should not have been given as much weight as they were. “He reported a fivefold increase [in brain tumors] among those who started using mobile phones before age 20,” she said. “If that’s true, you would see a brain tumor epidemic in that age group, but there is no difference in incidence trends since mobile phones were introduced.”

However, Feychting said, Interphone also found a 40% increased risk among the heaviest users. Although recall bias could explain that increase, “we don’t know that the entire increase is explained by recall bias. There’s some uncertainty. So, if someone is worried that RF exposure from mobile phones increases the risk, it’s easy to reduce the exposure by using a hands-free device.”

The IARC’s assessment now goes to WHO, its parent body, for possible guidance on cell phone use. But if WHO’s work wasn’t already hard enough, another international body almost simultaneously reached a somewhat different conclusion. The Standing Committee on Epidemiology of the International Commission on Non-Ionizing Radiation Protection (ICNIRP), chaired by Anthony Swerdlow, M.D., Ph.D., of Britain’s Institute of Cancer Research, reported in *Environmental Health Perspectives* that, “although there remains some uncertainty, the trend in the accumulating evidence is increasingly against the hypothesis that mobile phone use can cause brain tumors in adults.”

ICNIRP is an independent nonprofit, registered in Germany, which the WHO recognizes for forming guidelines on exposure limits.

A major argument of those scientists who find the evidence of risk unconvincing is that time trends in cancer incidence do not show any association with the dramatically increased use of cell phones over the past two decades.

“If the rates don’t start to rise in the next few years,” said Swerdlow, “it will be increasingly difficult to square this with the idea that these phones are a substantial cause of cancer.”

**Looking at Long-Term Data**

According to the *Annual Report to the Nation on the Status of Cancer, 1975–2007* (see J. Natl. Cancer Inst. 2011; 714-36), brain cancer incidence in the United States declined by 0.4% per year between 1987 and 2007. The UK and Nordic countries have reported similar flat or declining incidence rates.

The IARC working group downplayed the time trend analyses because most analyses examined trends only through the early 2000s, about 10–15 years after cell phone use became widespread. However, the most recent data from Sweden show no increase in brain cancer incidence through 2009.

“In light of the extremely high prevalence of use of cell phones, the absence of any increase in brain cancer rates in developed countries—including the Nordic countries, where cell phones were first used—provides the strongest evidence against a causative role of cell phone use in brain cancer risk,” said Tarone.

“If cell phones do cause brain cancer,” he said, “the first indication will be that we see some increase in brain cancer rates in the developed countries. That’s what happened with cigarettes and lung cancer.” The prevalence of smoking never got above 70% in men and 50% in women for any U.S. birth cohort, he said, yet 20 years after cigarettes started being mass produced, “people were aware something was increasing lung cancer rates. We have a much higher use of cell phones than we ever had of cigarettes in the population.”

But he conceded, “We can never be sure of the latency question”—that is, the time between exposure and diagnosis of cancer—“so you have to be vigilant and keep the rates under surveillance.”

In addition to many national surveillance programs, Tarone said, research endeavors are ongoing; a large-scale U.S. National Toxicology Program study of rodents exposed to cell phone frequencies; a prospective study called Cosmos that is recruiting 250,000 cell phone users in five European countries; and MobiKids, a case-control study of 2,000 young persons who were diagnosed with brain tumors between the ages of 10 and 24 years and 2,000 control subjects from 13 countries.

While awaiting the results of further research, Steven Woloshin, M.D., and Lisa Schwartz, M.D., the renowned Dartmouth team that specializes in communicating medical risk, advocate a bit of perspective: Annual incidence of brain cancer in the United States is 6.5 per 100,000. In all, 22,020 new diagnoses and 13,140 deaths from the disease were estimated for 2010. “So even if you believe there is an increased risk from using a cell phone, the increased risk is very small in absolute terms,” said Woloshin. “Your chance of being hurt by distracted driving because you’re using your cell phone wipes out the risk of getting cancer.”