

BiInitiative Report:
**A Rationale for a Biologically-based Public Exposure Standard
for Electromagnetic Fields (ELF and RF)**

The INTERPHONE Brain Tumor Study
Cindy Sage, Editorial Perspective

For at least three years, the largest brain cancer/cell phone study in history has languished under wraps at IARC because of bitter squabbling among contributing researchers over presentation, meaning and conclusions. Implications of the study are truly incendiary.

While we were all waiting, the number of cell phone users doubled to over four billion in 2009. What a great waste of time that could have been used to moderate the rollout of new, potentially dangerous wireless technologies. The wall of denial about whether low-intensity radiofrequency radiation can harm health has collapsed. If cell phones can cause cancer, and INTERPHONE statistics that show they can, then none of these other applications of wireless can be presumed safe either. The standards of ICNIRP and the FCC are obsolete, and the INTERPHONE results substantiate this. But for this inexcusable delay, we could have perhaps prevented millions from giving up their safe landline phones, prevented thousands of classrooms from going wireless, pushed R&D forward into safer product designs, and given parents fair warning about how and where their children may be suffering from the world's newly recognized cancer-causing agent.

There may be another way we should look at this, however. Anyone who watched the WHO EMF Program leadership, and its 'process' from the outside - between about 2003 and 2009 - would have given up all hope of a fair reading of the scientific situation, regardless of the actual data.

Strong industry ties, murky funding and obligations to sponsors, a moving target in its research designs and protocols, shifting obeisance among research teams, stealthy attacks on independent researchers and their work, wondrous and inexplicable changes in attitude on the part of key investigators rising through the scientific ranks, and the usual academic upheavals and personal dramas - all contributed to the general ennui that the 'fix was in'.

However, something else entirely happened. We would not be seeing this at all if some INTERPHONE members had not resolutely dug in, holding out for fair and forthright coverage of the incriminating evidence for risk. One can almost feel the smoke coming off some pages.

So, in balance, and at the end of a harrowing ride, I think we should do two things.

Thank the INTERPHONE teams, deeply thank Elizabeth Cardis for her genuine integrity and grace under pressure for every demure deferral on timing of its

release, thank EEA Director Jacqueline McGlade for stepping up early, and thank Christopher Wild of IARC for cracking heads together to get this out.

Wags could argue this is science-at-light-speed in comparison to paradigm shifts of old. Reflect on this. ELF-EMF was listed as an IARC 2B carcinogen in 2001, after a couple of decades of rancorous scientific bashing. RF has barely been around long enough with wireless technology exposures to have anything to study. Yet, we are on the cusp of change in a big way - 4 billion users of what is effectively a toxic drug-delivery device that causes tumors right where you apply it to the head should resolve into quick action now by global health agencies. To do otherwise is to court massive and preventable healthcare costs, loss of productivity, fragmented families, endless litigation and stall out new R&D ventures targeting safer approaches.

Among the findings:

The INTERPHONE study reports increased risk for malignant brain tumors (glioma). This is stunning news.

The take-home message is that the INTERPHONE study reports with as little as 1640 cumulative life time hours, the risk of glioma is increased somewhere between 40% and 96% (over controls for which their cordless phone exposure was not even factored out). Ironically, the INTERPHONE results lend support to the brain tumor meta-analyses by Hardell et al, Kan et al and Myung et al. INTERPHONE finds similar risks to the Hardell findings but at only 1640 hours - just three-quarters of Hardell's 2000 cumulative hours of cell phone use.

Tumor laterality is significantly correlated with the side of the head the cell phone is predominantly used, as well.

Any reports you hear that "Overall, no increased risk of glioma was observed with use of mobile phones" should be regarded as flagging the wrong bull.

If you look where one REASONABLY could expect to see early indications of glioma risk (at the longest latency we can find, since the technology is new), there is increased risk for glioma at 10 years and longer use.

The latency for brain tumors is 15-30 years. Not seeing risks sooner is meaningless (overall risks not rising). Seeing increasing risk at only ten years means that cell phones are a highly effective carcinogen.

If you look at results for less than ten years latency, there is a reduced risk of glioma (a malignant brain tumor). You may see headlines spinning this to mean cell phones are good for you, or the data are too hinky to interpret. But this kind of reporting sleigh-of-hand is likely based on short latencies, very lightly exposed phone users, controls that have other exposures that blur the distinction between cases and control groups, very low participation rates for controls, or other ways that flaws in the study design dilutes the risk.

And, it just might be true that there is some protective effect for the first years, if the body is launching some adaptive response to a highly bioactive exposure for which the brain is protecting itself as best it can. But, like any adaptive response, like that of the body to adrenal stress for example, it can only go on so long before there is exhaustion of the adaptive response, and ultimately, disease or death.

And, this is early in the game. We shouldn't be seeing ANY increases yet, its too soon - if you look to other carcinogens that induce solid tumors (smoking,

asbestos). None of these known carcinogens would have left such an early footprint in the data as has use of cell phones.

The INTERPHONE likely underestimates risk in several important ways.

- The INTERPHONE only presents risks is for middle-aged adults so it is likely the results would be higher if all users were included in these statistics.
- The study ignored children (who are reported to have more than a five-fold increased risk in comparison to a doubling of risk for adults). The study also ignores older people (over 59) that also likely would have upped the risks.
- The definition of an 'exposed' person was as little as one call per week for six months. Clearly this mixes up very light users into the mix, and can cause underestimation of true risks for normal cell phone use that may be hundreds of hours per month.
- Cordless phone use was ignored too, so it is another factor that likely causes underestimation of true risk, since those who are assumed to be unexposed (the controls) in fact may have substantial cordless phone radiofrequency radiation exposures that tend to minimize the differences in cancers between controls and exposed participants.
- Low participation rates for controls can and probably did skew this data toward null results.
- The data only report brain tumors from 2000-2004. This is already old data. What would the results show today? Sitting on the final results for so long means we've lost valuable time to make mid-course corrections.

The commentary by Rodolfo Saracci and Jonathen Samet is a brave attempt to put INTERPHONE results into some plain language. But, they fall into the same old semantic snake pit as most scientists and their embedded assumptions are showing.

Most people don't want or need 'conclusive' evidence. They are not likely to wait to hear 'we have proved a causal relationship' between cell phone use and deadly brain cancer before they shift behaviors to less risky alternatives. How long did it take for smoking? How many lives were lost?

People make choices every day with inconclusive information. Delaying the release of these data prevented an 'early warning' that will likely have global health consequences we cannot even categorize today.

Saracci and Samet err in concluding that the report 'tolerates diametrically opposing readings'. In fact, the report finds risks where one would reasonably expect to find them. With longer use. On the side of the head where the phone is most used. The tumors show up more on that side of the head, as well.

Their confusion perhaps is rooted in this false dichotomy of scientists that 'you have nothing until you have proof, so anything in between evidence and proof can be read as nothing or something, depending.' If you don't have causal evidence (read, proof according to the highest possible scientific bar for judging the evidence) then, people can take opposite views of the emerging evidence. Chapters 1, 16 and 17 of the BioInitiative Report address this at length.

Most reasonable people who have to make decisions about what to buy, what to expose their heads to - don't want this kind of thinking done by others for them.

They'll reject this kind of thinking as a false choice. Or worse, a false assurance of safety where none is warranted, and the data may be pointing in the direction of real hazards. Just not yet rising to the level of clear and convincing evidence, which, in science-speak, is proof beyond doubt.

Involuntary exposure (second-hand radiation) is entirely ignored in this commentary. It is more than just the individuals' choice to use a cell phone or not. It is about the extended consequence of thinking that wireless is harmless, or not harmful enough to matter. The whole portfolio of impacts on mental function, cognition, concentration, attention, behavior, judgment and sleep related to the involuntary and chronic exposure to second-hand radiation that is linked to global reliance on cell phones must become a part of this conversation.

If there is legitimate evidence of emerging risks to health that can result in disease and death, give them the results and let them decide. People are smarter and have more common sense than scientists allow for. People in general use different standards for adoption or aversion, when it comes to personal family decisions about allowable risk.

Certainly they do not gamble with their children.

The "Key Message" at the end of the Cardis et al study still unnecessarily downplays possible risks. If the message from INTERPHONE is '*we wasted ten years and thirty million euros of public money*' on a study that says nothing much, then heads should roll. To end on this note is to undermine the real need now for change, for education, and for safer technologies.

It is disingenuous to conclude that "(T)here were suggestions of an increased risk for glioma". The data reveal an odds ratio of 1.4 with a 95% confidence interval of 1.03-1.89) and odds ratio for ipsilateral use of 1.96 (CI=1.22-3.16) for cumulative call time.

Both are clear indications of increased risk for those in the study with the most exposure. There were more than suggestions. There are hard data. And, that data are consistent with earlier studies and meta-analyses by Hardell et al, Kan et al and Myung et al showing the same trends. The work of Hardell et al, in particular has been unfairly maligned; how ironic the INTERPHONE results now mirror this early and prescient work of the Orebro University/Umea team in Sweden.

Since EMF in general has been shown to be effective for therapeutic use at exposure levels below existing public safety standards (proof that EMF is bioactive at low-intensity exposures and can promote health in specific circumstances); why should we be so hesitant to accept the inevitable conclusion that chronic exposure to EMF from cell phones can also be a health risk as well?

What Should Happen Now?

This study serves as an undeniable scientific benchmark that EMF is an environmental toxin.

The biological effects of low-intensity ELF and RF are now inarguably confirmed, although it didn't take the INTERPHONE to establish this; only to help corroborate it.

The existing FCC and ICNIRP public safety limits are clearly inadequate in the face of new technologies across the spectrum.

The standards for public safety around the world have again been shown to be

largely inadequate and must be brought current taking into account not only the INTERPHONE results, but the large body of evidence implicating very low-intensity EMF in many kinds of health impacts. The BioInitiative Report addresses this more fully in Chapters 1, 3 and 4.

Chronic exposure to low-intensity ELF and RF appear to be both carcinogenic and neurotoxic; bioeffects and adverse health effects that are now emergent from the scientific literature can be reasonably presumed to result in human diseases and death and should be reclassified by IARC accordingly.

New, biologically-based public exposure standards for ELF and RF are now justified. The BioInitiative Report suggests new public safety limits in Chapters 1 and 17.

The burden of proof of safety now shifts directly back at industries to develop and demonstrate that new wireless technologies for voice and data transmission can be safely used.

New wireless technologies directed at children should be banned, and strong warnings and limitations on use of existing devices (cell and cordless phones, game players, wireless devices of all kinds) should be developed and implemented now. DECT-type phones should be phased out. Wireless antenna facilities have no place on or near school campuses. Wireless computers and educational devices in schools and homes should be eliminated. All places providing medical care should be wired, not wireless, for the protection of patients, families who visit, medical and administrative staff, and newborns. Second-hand radiation should become a focus for public health actions to provide education, choice and reduction particularly for pregnant women and for children of all ages. The cognitive and behavioral problems among the young are epidemic and should be a national research focus (neurology, pre-natal and peri-natal exposures to ELF and RF, etc). National wireless programs like SmartGrid/Smartmeter and wireless broadband that are slated to affect millions of people should be discontinued. Fast and secure wired alternatives need to be developed.

Industries should no longer be permitted to dictate US or European policy on public safety limits for ELF and RF, in order to keep rolling out their new merchandise.

It is time for industry groups to stop writing the laws our governmental agencies use in regulating their product emissions.

The elaborate charade of the overall WHO research program on health risks of electromagnetic radiation (both ELF and RF) was thought to be irretrievably lost to the invisible choreography of the entitled - those hand-picked emissaries of industry and government - who spent a decade pushing reams of irrelevant and biased materials out to the unsuspecting public, as proof of their busy-ness and impartiality.

The seemingly impenetrable walls of WHO shut out any inquiry for years. Journalists could not attend to report on meetings of its EMF Program Advisory Group. Independent scientists and public health and policy experts were never given access to the interior workings of these committees. Instead they were provided with assurances from its leaders and window-dressing in the way of progress reports and frameworks for discussion. For years, WHO's EMF Program gave cosmetic appearance of due process, but was clearly exclusionary and intentionally hidden from the mainstream public inspection.

It is time for Andrzej Rys, the Director of Public Health for the European Commission; and Maria Neira, Director, Public Health and Environment, WHO to clean ranks within their staff that have lost the public trust, and prioritize ELF and RF health issues into their global health planning work.

It is time to expand the membership of expert committees that advise governments, even if it means shaking up their established memberships and entrenched attitudes. Expert committees need to clearly and consistently address the question "what is the possibility of risk" and not answer it with "we find no conclusive evidence of harm".