www.safewireless.org
www.health-concerns.org

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Dear Eileen:

In response to your query regarding new information we at the Safe Wireless Initiative have gathered relative to your work with the EMF Discussion Group, I would offer the following. Please feel free to circulate this summary information to Sir William Stewart and his colleagues, and pass the message that I would be happy to provide additional information if they would find that useful.

Note that the Safe Wireless Initiative (www.safewireless.org) is a project within the non-profit Science and Public Policy Institute, based in Washington, D.C. The Science and Public Policy Institute, established in 1992, carries forth a mission to educate the public about issues where science and public policy appear to be at odds. Our overall goal is to ensure that good science is applied as often as possible to public policy decision making.

The Safe Wireless Initiative, now with more than 10,000 members, was established in 2002 to facilitate the deployment of www.health-concerns.org, an independent post-market surveillance registry gathering symptom information from consumers who believe they have been adversely affected by electromagnetic radiation. The initial funding for the registry was gleaned as part of a legal settlement of a lawsuit brought against the mobile phone industry in Illinois. As the only independent post-market surveillance program in operation in the world, we have had more than one million visitors, and now have confidential record of thousands of symptoms among people with health concerns related to mobile telephones, base stations, wireless computers and various other sources of EMR.

During 2005, the scope of work encompassed by the Safe Wireless Initiative expanded to include a variety of public outreach and research efforts using the information gathered through the registry as well as from other scientific and medical sources. We currently have projects underway in more than a dozen different areas. The following is summary information related to some of our more recent assessments.

POST MARKET SURVEILLANCE PROGRAM:

This program is derivative of data collected through the health-concerns registry as well as from clinicians across the world who report to us their observations treating patients with suspected EMR related disease. The data gathered are self-reported and are confidential to the patients; however, we regularly evaluate trends and summary statistics. It is important to keep in mind that this database is a self-selected group so findings are not as scientifically rigorous as we would like. Nonetheless, these clinical reports are extremely useful as qualitative pointers of where disease occurrence may be heading. In most circumstances, such post-market surveillance efforts would be conducted by industry and overseen by government regulatory agencies. Such is the case with other potentially dangerous products such as pharmaceutical drugs and medical devices. However, because none of the worldwide regulatory bodies implemented pre-market safety testing of wireless technology in the early days of deployment, the public is now in trouble because of this worldwide lapse of government responsibility. This program is a modest attempt to help fill the void.

Overall, we are now seeing more and more reports of symptoms that are consistent with electro-sensitivity. Those symptoms range from sleep and learning disorders to neuromuscular conditions and tumors. Of note is that while in the first three years of the program, most symptoms were associated by respondents to their mobile phone usage and included mostly chronic conditions such as brain and other cancers, we are now seeing the majority of symptoms being associated with mobile phone masts and other environmental sources of EMR. We believe this may well be a reflection of the every increasing ambient levels of EMR in major cities. Our assessment suggests that the background levels that are the result of the exponential increase in wireless technology infrastructure are causing an unprecedented rise in information carrying electromagnetic fields. The significance of this is discussed below where I describe our disease mechanism work.

PUBLIC HEALTH OUTREACH PROGRAM:

Safety Alerts:

As a major component of our public outreach efforts, scientists within the Safe Wireless Initiative network regularly monitor new information regarding wireless technology dangers. Over the past year, the Safe Wireless Initiative has issued six Safety Alerts aimed at particularly high risk groups or issues that rise to a level of significant public concern. Our most recent Alert addressed specific concerns about firefighters and emergency first responders where we believe the effects of chronic exposure to EMR exacerbates the damage done by high chemical and physical stressors in the workplace of these professionals. The battery of Safety Alerts is available at www.safewireless.org.

Intervention Demographics Research:

Prompted by our concern that information about both the dangers of widespread EMR exposure and public health interventions to address that exposure is systematically being distorted in the media, we have put in place a program to identify means of reaching out with this complicated science. Our work includes research on the information threshold for retention, credibility factors that most influence acceptance of health mitigating behaviors and the roles of both fear and empowerment in promoting healthful behaviors.

Most recently, for example, we participated in focus group research of U.S. teens, aged 15 to 18, to explore their views and attitudes about mobile phone health risks. Among the findings: young people know about the EMR health risk controversy, but believe it has been fixed by the government; young people believe the technology is safe because their parents have approved their use of it; and young people won't be moved about the danger until they see scores of friends with brain cancers related to cell phone use. This work suggests an extreme reliance of young people on both government leaders and the family structure to keep them safe as well as a high degree of denial about the problem.

Film Project Support:

As part of our support of public education, we have provided technical advice to a number of groups producing films addressing various aspects of this problem. One film project, "The Cell Phone War", was produced at the request of French and German television networks as a documentary. When the film was completed in 2005, it was not shown immediately, supposedly because of "no room for it in programming schedules." In July of 2006, when the French network, FR2 announced the premier showing of the French language version, French mobile phone industry executives threatened to pull all advertising money from the stations if the film was shown. After a legal exchange, the film was altered and shown during midnight to early morning time slots. The German language version has never been shown publicly, although the film was delivered to German television more than one year ago.

The Safe Wireless Initiative obtained rights to distribute an English translation of the film through our website. Those DVDs are now being circulated with the Safe Wireless Initiative receiving a $2.00 donation from the filmmakers for each DVD sold. In watching the film, it is relatively easy to spot where adjustments were made due to industry pressure to lessen the impact on mobile phone sales.

The filmmakers involved in the television documentaries are now involved in the production of a new film for cinema, "The Boiling Frog Principle", which is expected to be released in 2007. We are providing scientific support for that film.

Finally, a fictional adventure feature film with a working title, "Degree of Caution", is also in production stages in the United States. We are also providing scientific support for that film.

SCIENTIFIC RESEARCH:

EMR Dosimetry Research:

- The current science shows that there are two distinct types of radiation plumes capable of contributing to the development of disease in those exposed. The near-field plume has been studied most extensively relative to mobile phone exposure and the science indicates that the near-field plume – usually within six to eight inches of the center of the antenna – is the most intense and likely the most efficient tumorigenesis contributor.
- The far-field plume is considered to have less of an impact – with most effects being acute morbidity – although at least one study has suggested that genetic effects can indeed result from far-field exposures. Anyone who uses a mobile phone is exposed to both the near-field and far-field radiation. Anyone who uses wireless connection to the Internet is exposed to both near-field and far-field radiation. Those living or working in the vicinity of base-stations or masts are exposure to ambient far-field exposure, at least.
- Over the past four years, the dosimetry science has become very precise with respect to hand-held wireless devices. It is now clear that the primary indicator of the size of the near-field plume is the amount of power being used by the phone in carrying the information signal. The further away the nearest base station, the more power is needed to carry the signal. Distance and resultant power are more important to the size of the radiation plume than number of calls made or the length of calls made. Thus, while the intensity of the radiation plume is a complicated variable, the most important aspect is that the intensity of the plume determines the amount of tissue exposed.
- Over time, as the density of base-stations has increased around the world, the amount of power necessary to carry a call has not concommitantly decreased as one would expect. This is because more and more modalities – such as music and movies – have been added to hand-helds so power continues to be needed to carry the more data laden signals.
- Most importantly for public health, we are concerned that early adopters of the cell phone would have years of exposure to higher intensity radiation plumes. It is noteworthy that we have found no substantive scientific evidence to suggest that there is a threshold below which the radiation plume is safe. The no threshold data is also supported by the research showing that the mechanism of harm from EMR is not intensity dependent.

EMR Disease Mechanism Research:

- The science now shows that the intensity of the radiation plume is not the primary determinant of the severity of damage caused by cell phone use when the power levels used produced non-thermal fields. Research now shows that the coherence or form of the information carrying wave is the determining factor in non-thermal exposures. This adds another complicating aspect to the elements of dose, but it also adds plausbility to the plethora of disease conditions now being reported as being related to far-field or ambient exposures to EMR through base stations and masts. It is possible that some exposures in mobile phone users reach thermal limits, however, most scientists now assume the mechanism to be non-thermal.
- The accumulative science now shows that the primary non-thermal mechanism of danger to human tissue within the near-field plume and likely from far-field exposures derives from a series of events triggered by recognition by the biological cell membrane that a coherent, invading radio wave is present.
- It is noteworthy that the carrier wave – in most cases many years of around 837 megahertz and some years of around 1900 megahertz – is not easily recognized by the biological cell membrane. It is oscillating too fast to be picked up cell membrane sensor proteins. The membrane recognition occurs when the information carrying wave – a secondary wave oscillating in the hertz range – is present. For example, there is a 2 hertz signal identifying presence in range of a base station; also, when talking occurs there are hertz frequency waves carrying voice informaiton.
- Once the membrane recognition occurs, a series of protective biochemical reactions are initiated inside the cell as a means of cellular protection. Included are stress protein responses that serve to effectively "harden" the cell membrane and disrupt active transport. The "membrane hardening" effect causes an intracellular build-up of waste products including highly reactive free radicals.
- These reactive molecules are involved in at least two pathways associated with cancer induction. The first occurs when the mitochondria are attacked resulting in both cellular dysfunction (for example evidenced by studies showing leakage in the blood-brain barrier following EMR exposure), and interference with normal DNA repair processes (for example, evidenced by studies showing the presence of micronuclei in cells following EMR exposure).
- It is noteworthy that several experiments have shown that these effects can be eliminated when EMR exposure is taken away. This is the important concept of dose-response down, a critical component of the Koch-Henle Postulates for determining cause and effect.
- From a chronic disease perspective, these two mechanistic pathways impact all critical stages of tumorigenesis. DNA repair interference and disruption of normal apoptosis can lead to genetic mutational changes that many times are self-replicating – consistent with the process of tumor initiation. Fixation of the deviant cells is evidenced by the presence of micro-nuclei in a number of studies of mobile phone radiation exposure. General impairment of normal cellular function, especially mechanisms

that are meant to stop aberrant cell growth, can facilitate tumor promotion or growth to a neoplastic stage and progression to metastases.

Epidemic Curve-Based Projections of EMR Related Morbidity:

- The complications of EMR dosimetry make it difficult to discern clear dose-response relationships in the published epidemiological studies because the correct variables – distance from base station at the time of call and precise area of brain tissue exposed by the ever changing near-field plume – can not be easily measured. Because exposures can not be accurately measured, it is unlikely that epidemiological studies will be a reliable indicator of the absence of risk for decades to come. All of the epidemiology studies completed to date that purport to indicate the absence of increased disease risk have inadequate power to detect risks less than a doubling. Thus, from a purely scientific perspective, these studies provide no reliable evidence regarding public safety.
- These difficulties in measuring exposures cause definite misclassification in the assessment of independent variables in the published and otherwise reported epidemiological studies. These misclassifications most likely bias those results toward the null. This means that results in epidemiological studies that do indeed report increased risk are likely underestimating the risk.
- These factors make it imprudent to rely on standard epidemiology/toxicology methods to assess risks in consumers. Because the data are inherently unreliable – likely missing true risks and giving false information about the absence of risks or safety – we found it necessary to identify more aggressive means of making informed risk assessment and risk management decisions.
- As part of this aggressive public health protection program, we regularly conduct standard estimate projections that will help us determine where our limited resources should be focused to have the most public health protection impact. Part of this process includes the use of attributable risk derivative of statistically significant positive results in published epidemiology studies.
- It is noteworthy that there are more than two hundred published, statistically significant hypothesis tests indicating an increase in the risk of brain and eye cancer currently in the peer reviewed literature.
- Our public health intervention approach applies those published epidemiology data to the standard textbook formula for Attributable Risks: AR=RR-1/(RR-1)+1
- We then apply those data to the derivation of mobile phone use related epidemic curves where we are then able to estimate numbers of new cases directly attributable to mobile phone use by year worldwide.
- We assume a ten year cancer latency period.
- In deriving those estimates, we apply the published morbidity statistics obtained from the U.S. National Center for Health Statistics, as well as the most recently published global estimates of mobile phone use distributed by the mobile phone industry itself.

- Our most recent epidemic curve estimates indicate that for primary brain cancer, in 2005 there were 20,000 new cases directly attributable to mobile phones; by the year 2010, the curve indicates that number will be on the order of 300,000 new cases worldwide.
- For eye cancer, the curve indicates 10,000 new cases worldwide in 2005 and 100,000 attributable cases by the year 2010.
- When general morbidity data for the range of symptoms being reported to our registry as consistent with electro-sensitivity are used as the dependent variable, the epidemic curve indicates that by the year 2015, one in every four persons who uses a mobile phone will have a symptom attributable to the phone.

PREVENTIVE INTERVENTION PROGRAM:

Consistent with the public health protection goals of the Safe Wireless Initiative, we have initiated and active program of identifying and evaluating the range of protective interventions that may serve to mitigate the myriad adverse effects predicted by the exceedingly alarming epidemic curve projections. We have adopted the standard and time-tested Public Health Paradigm as our model, encompassing primary, secondary and tertiary preventive as complementary, bundled interventions. According to that template, primary preventions address issues of exposure; secondary preventions address issues of symptom mitigation; and tertiary preventives address issues of rehabilitation and long-term risk reduction.

Bolstered by our research program, we are now able to identify primary, secondary and tertiary interventions by their likely impact on the specific disease mechanisms contributing to clinical disease. For example, primary interventions are those that prevent the occurrence of inappropriately triggered cell-membrane mediated protective mechanisms leading to increased intracellular free radical concentration. Secondary preventions are those that restore disrupted intercellular communication that is the result of cell-membrane damage. Tertiary preventions are those that, when primary and secondary preventives are in place, facilitate the repair of damaged tissue. This model is parallel to that employed in clinical pharmacology and other mainstream programs for clinical intervention.

To facilitate our ability to “scratch beneath the surface” with regard to publicly available interventions, some of which are proprietary to the various commercial interests who produce them, we have begun a program of cooperation with what we term Strategic Alliance Partners. These relationships with other non-profits and commercial entities, allow us through non-disclosure and other types of confidential information protections, to evaluate proprietary science in depth. These accesses are critically important to our being able to assess which interventions work and which don’t, and more importantly, to design strategies for combining interventions that will be of most positive impact to public health.

Thus far our work in this area has been challenging. To be sure, there are no "silver bullet" solutions to the problem of EMR related health risks. In fact, no where have we identified any one product or intervention that offers, in and of itself, adequate promise of protection. Nonetheless, the commercial landscape is littered with fraudulent claims being promoted by companies as inducements to sell products. Part of our goal is to bring truth to what is being promoted to consumers; however, the challenge is compounded by the reality that competing commercial interests must learn to work together and to put the goals of public health above their parochial financial interests.

DATA INTEGRITY PROGRAM:

- One of the biggest barriers to solving this emerging public health problem are the orchestrations of the mobile phone industry to "keep the lid" on the issue.
- Since the publication of the results of the $28.5 million WTR research program indicating mobile phone health risks, the mobile phone industry has put into place a global program to control the research agenda addressing the question of mobile phones and health effects. The mobile phone industry experience with the WTR – independently conducted research – is widely perceived within the industry to have backfired and they do not want to make the same "mistake" again.
- The mobile phone industry program is sophisticated, and involves controlling the outcome of research by directly and indirectly controlling the funding, as well as controlling the dissemination and interpretation of the completed science. We have clear evidence nown that, in many cases, the industry money is, in effect, laundered through such groups as the World Health Organization, the American Cancer Society and regulatory groups such as the U.S. Food and Drug Administration and the Federal Communications Commission. In other cases, industry funds the gathering of "independent scientists" to review the state of the science and then use the opinion as evidence of "no problem", cited in cell phone package inserts and promotional materials.
- We have strong evidence in hand to show that the key bodies that provide emission standard advice to regulatory agencies, including the IEEE, the ANSI, and ICNRP are strongly influenced by the mobile phone industry. This has now moved to a point where government agency representatives on various committees have abstained from votes that are too obviously industry set-ups.
- The result is a clear dichotomy: results of studies, opinions of review groups and information dissemination tactics are discernabley dependent on where the support funding comes from. It is a classic "follow the money" forumula.
- Thankfully, in the past year, scientists have begun to speak out more publicly about the industry "hijacking of the science" in both scientific fora and the general media. It is becoming an accepted fact within science circles that the influence of mobile phone industry money is significant.

- Prompted by some early work by Dr. Henry Lai, we have continued to array the published studies in terms of funding source – i.e. as either independent or industry funded or otherwise influenced. Our data show that mobile phone industry funded/influenced work is six times more likely to find "no problem" than independently funded work. The difference is statistically significant. The industry thus has significantly contaminated the scientific evidence pool, with the clear purpose of making sure that a general "weight of evidence" analysis would always tilt in the favor of their position.
- This factual information begs the question of what studies should be admissible in the myriad public health assessment processes in place around the world. At the very least, there should be controls on how specific studies are weighted in deliberations where consumer safety is being evaluated.
- In the U.S., we are exploring how this factual aspect could be used to create a presumption that industry funded research is biased and therefore should not be admitted in litigation or in public health proceedings. We note that in the early days of litigation around theU.S. Civil Rights Amendment, it was decided that facts indicating discriminatory outcome were considered to create presumptions of discrimination. The parallel situation exists here. There is no question that the facts (i.e. study results by funding source) show a discriminatory outcome

I trust this information will be useful to you, and again, we are happy to follow up in whatever manner you believe would be most fruitful.

Sincerely yours,

George

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