

Written Statement of Howard W. Ory, MD, MSc

Introduction

I am Dr. Howard Ory. I received my MD degree from Tufts University Medical School in 1969 and joined the U.S. Centers for Disease Control (CDC) in 1971. I received a Masters Degree in Epidemiology from the Harvard University School of Public Health in 1974. I worked at the CDC as a practicing epidemiologist for twenty-three years until my retirement in 1994. While at the CDC, I held various management positions, including Deputy Director for Epidemiology. Over the course of my career, I have conducted multiple large-scale epidemiologic studies involving numerous diseases, including cancer. The focus of much of that research was to determine the safety of, for example, common medical practices and medications and to consider potential warnings. Over the course of my career, I have consulted on numerous public health issues for the CDC, as well as other public health agencies such as the World Health Organization and the Food and Drug Administration. After retiring from the CDC, I was a Vice President for Health Care Research at Prudential Healthcare. I left there at the end of 1996, and since then I have been a private consultant in epidemiology. I have published more than 100 scientific articles in peer-reviewed publications on a wide range of subjects. My full resume is attached.

Purpose and Summary of Statement

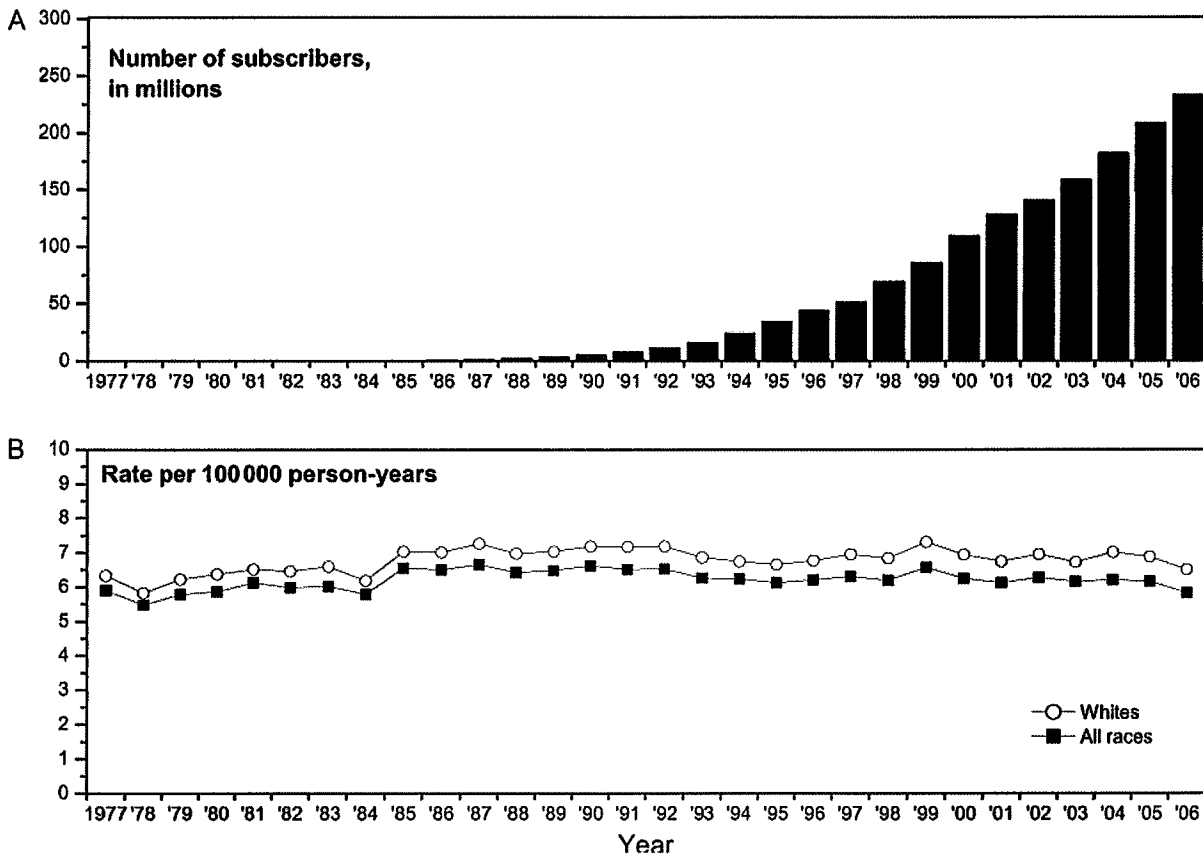
I am submitting this statement on behalf of the wireless industry to review the available scientific evidence on potential health effects of radiofrequency ("RF") emissions from cell phones. In short, there is no reliable evidence that RF emissions cause adverse health effects. In view of the science and of the comprehensive RF safety regulatory regime overseen by the Federal Communications Commission (FCC), there is no need for state legislation in this area.

There has not been an increase in the incidence of brain cancer and other nervous system tumors following the introduction of wireless phones.

Brain cancer and other nervous system tumors (which I will refer to collectively as "brain cancer") occurred long before the introduction of wireless phones and would continue to occur even if people no longer used wireless phones. In other words, there is a natural incidence of brain cancer in the population, which includes people who use wireless phones. If, as some people speculate, wireless phone use causes brain cancer, then we would expect to see an increase in the incidence of brain cancer coincident with the use of wireless phones. We have not seen any such increase.

The U.S., like many other countries, has tracked the incidence of brain cancer for many years. These data are collected by the National Cancer Institute (NCI) and the CDC and are considered representative of the entire United States. Over the period extending from when wireless phones were introduced in the US, about 1985, through the period they have become wide spread, approximately the year 2000, to 2011, when cell phone use was ubiquitous, there is no suggestion whatsoever of an increased incidence of brain cancer. In the U.S., the incidence of brain cancer has not increased since 1985. This is demonstrated in the charts below, which are taken from a recent NCI study. This study states, "[d]uring the period of use when mobile phones was increasing sharply, the overall incidence of brain cancer changed little." The NCI report con-

cludes, "Overall, these incidence data from the United States based on high quality cancer registries do not provide support for the view that use of cellular phones causes brain cancer."¹



In their 2011 annual report to the nation on the status of cancer, which had a special focus on brain cancer, the NCI noted that the incidence of brain cancer had fallen 0.4% per year from 1987-2007.² The most recent NCI annual report affirms the flat to falling brain cancer trend through 2010.³ The most recent data from the CDC also confirms the flat to falling incidence of brain cancer through 2011⁴. The CDC data is based on virtually complete ascertainment of all new cancers occurring in the US. (see attachment)

Latency

In the U.S. alone, there were almost 40 million users of wireless phones by 1996 and there were almost 200 million in 2005. Currently, there is more than one cell phone subscription per person in the US. Even given the latency of brain tumors, by which I mean the time it takes to develop a tumor, the NCI notes that there has been "sufficient time" for an increased incidence of brain

¹ Inskip, Hoover and Devesa. Neuro Oncol. 2010 Nov;12(11):1147-51.
² Kohler, et al. J Natl Cancer Inst. 2011 May 4;103(9):714-36.
³ Edwards, BK, et al. Annual Report to the Nation on the Status of Cancer, 1975-2010, Cancer 2014;120:1290-314.
⁴ United States Cancer Statistics 1999-2011, Accessed at <http://wonder.cdc.gov/cancer-v2011.html> on March 26, 2015

tumors caused by cell phones to begin to be detected in these surveillance data.⁵ Again, however, we do not see any such increase.

Time trend data from other countries, including England, Norway, Denmark, Finland, Sweden and Switzerland, strongly reinforce the conclusion that in spite of sufficient time having elapsed, there has been no rise in brain tumor incidence. While cell phone use in those countries began earlier than in the U.S. and has risen at least as dramatically as in the U.S., brain cancer incidence rates have not changed as cell phone use has increased in the above listed countries through at least 2007 and through 2009 in Sweden where such data is available.⁶

The most recent Deltour study (2012) addresses the latency issue extensively. They note: "We detected no upward turn in the time trends of glioma incidence rates in the Nordic countries during 1979-2008, overall or in any subgroup by country, age, or sex among adults.... These analyses are based on the entire adult population of Denmark, Finland, Norway, and Sweden (17 million people) and are strengthened by the comprehensive high-quality cancer registration in these countries.... If mobile phone use causes brain tumors, the change in prevalence of use from 0 to nearly 100% over a 20-year period would eventually influence the incidence rates of these tumors. Conversely, a lack of change in the incidence time trends, at any point in time, would constitute evidence against this association.... Our data indicate that, so far, no risk associated with mobile phone use has manifested in adult glioma incidence trends...."

Time Trend Data in Children and Adolescents

While the above chart and data from other countries refer to all age groups combined, these studies have also looked specifically at children and adolescents under the age of 20 years. The results are similarly reassuring. In the US, Norway, Finland, Sweden, and England these studies report stable time trends in the incidence of brain tumors in these countries in people under 20 years of age. As the authors of the most recent time-trend study conclude about time trend data relating to those under 20 years of age: "These data are in line with our evaluation of time trends of brain tumor incidence in Sweden and altogether provide little support to the view that mobile phone use increases the risk of brain tumors."⁷ In fact, there is now strong, affirmative evidence from time trend data that through 2011 in the U.S. and 2009 in Sweden cell phones have not caused an increase in brain cancer in people less than 20 years of age. Given that trends in brain cancer have remained stable in young people, it is tautological that there has been no increase in brain cancer in young people that could have been caused by cell phones.

Mechanism

⁵ Inskip, et. al., op. cit.

⁶ Deltour et al. *J Natl Cancer Inst.* 2009; 101:1-4; Roosli et al. *European Journal of Cancer Prevention* 2007; 16:77-82; de Vocht et al. *Bioelectromagnetics*. 2011 Jul;32(5):334-9; Aydin et al. *J Natl Cancer Inst.* 2011; 103(16):1264-76; Schmidt et al. *Pediatr Blood Cancer*. 2011 Jan;56(1):65-9; Ahlbom et al. *BMJ* 2011; 343:d6605; Deltour et. al. *Epidemiology* 2012; 23: (epub Jan 12 ahead of print).

⁷ Aydin et al, op. cit.

There is no known mechanism by which wireless phones could cause cancer.⁸ Wireless phones emit a form of radiofrequency energy that is part of the electromagnetic spectrum. This energy is called non-ionizing radiation. People use many things that emit non-ionizing radiation, including televisions, radios, baby monitors, and cordless phones. The use of the term “radiation” in connection with the energy from wireless phones can cause confusion and fear. Non-ionizing radiation is different from what people commonly think of as “radiation.” An x-ray is a good example of an exposure people think of when “radiation” is mentioned. An x-ray is one of the common forms of ionizing radiation. Non-ionizing radiation and ionizing radiation are quite different. Ionizing radiation, such as an x-ray, has the ability to damage DNA in human cells and therefore, can cause cancer at high doses. By contrast, non-ionizing radiation from a wireless phone lacks the ability to damage DNA.⁹ Therefore, there is no reason to believe that wireless phone use could cause cancer.

A prominent researcher in this area and former director of the World Health Organization's RF research program, Michael Repacholi, has summarized the lack of support for any known mechanism: “In summary, the results of the *in vitro* studies are consistent with the results of the mechanistic studies, and despite extensive research that have failed to establish any relationship between exposure to RF fields and cancer. No clear pattern of evidence identifying a non-thermal mechanism that could underlie any adverse health effects of RF exposure has been identified.”¹⁰

Despite the lack of any basis to suspect that wireless phone use could cause cancer, this issue has been studied scientifically for years. The two types of studies that provide the most information are studies in humans and studies in animals.

Epidemiology – Studies in Humans

Epidemiology is the study of causes of disease in human populations. There have been multiple epidemiologic studies of wireless phones and brain cancer. These studies have been conducted in different countries, have used varying methods and cover the time period in which wireless phones have been in use. A review of the overall results of these studies demonstrates the lack of evidence for a causal relationship between wireless phone use and brain cancer. A warning suggesting to consumers that exposure to the electromagnetic radiation from cell phones may cause brain cancer is not supported by the science.

Conclusions about causation cannot be based on any one particular study; they should be based on the data as a whole. When drawing conclusions from scientific data, scientists look for consistency in the results across studies. One technique used to evaluate multiple epidemiologic studies is called meta-analysis. Meta-analysis is a statistical technique that combines data from multiple studies in order to assess any potential association between the exposure and the disease (here, between wireless phones and brain cancer). In addition, this method identifies which studies are inconsistent with the overall result from the combined data.

⁸ Boice and Tarone. *J Natl Cancer Inst.* 2011 Aug 17;103(16):1211-3; Repacholi, et. al. *Bioelectromagnetics.* 2011 Oct 21. doi: 10.1002/bem.20716. [Epub ahead of print]

⁹ Boice, op. cit.

¹⁰ Repacholi, et. al. *Bioelectromagnetics.* 2011 Oct 21. doi: 10.1002/bem.20716. [Epub ahead of print]

In September 2009, the International Committee for Non-ionizing Radiation Protection (ICNIRP) published a meta-analysis of all existing studies of wireless phone use and tumor risk.¹¹ ICNIRP's review included the published studies that have been conducted as part of the thirteen-country INTERPHONE study coordinated by the World Health Organization as well as studies conducted by Dr. Hardell's group in Sweden. ICNIRP concluded that there was no overall association between wireless phone use and brain cancer, and this result was true even in people who had used a phone for more than ten years. ICNIRP identified only one outlier – the pooled analysis of the studies conducted by Dr. Hardell. A 2013 meta-analysis by Lagorio also notes that Hardell's data is an outlier.¹²

In July of 2011, after the publication of the full INTERPHONE study, ICNIRP reviewed the issue of cell phones and brain cancer again and concluded, "Although there remains some uncertainty, the trend in the accumulating evidence is increasingly against the hypothesis that mobile phone use can cause brain tumours in adults."¹³ ICNIRP noted that time trend data "can give powerful evidence constraining what can reasonably be proposed as an etiological relationship." They reviewed the same time trend data that I presented above and noted these data "showed no indication of increases in brain tumour incidence in relation to the introduction and growing use of mobile phones, up to 20 years after their introduction and 10 years after their use became widespread." Finally, ICNIRP noted that the recent studies dealing with exact location of the brain tumor, "which one would expect to give the most rigorous analysis since it has greater precision without bias, does not support a causal association."

The elevated risks shown in some case-control studies are incompatible with Deltour's (2012) incidence trend findings, discussed earlier. Deltour notes that many of the elevated risks found in some case-control studies "are implausible, implying that biases and errors in the self-reported use of mobile phone have likely distorted the findings."

At the end of 2011, a prospective Danish study that included information on 3.8 million person-years of follow-up was published; this study finds no increased risk of brain tumors even after 13 years since beginning cell phone use. While the Danish cohort study, like all epidemiologic studies, has limitations, it is consistent with the time trend data, and the Benson results (below) showing no association of cell phone use and brain cancer over a long time period.¹⁴

The 2013 publication by Benson *et al*¹⁵ is the most recent prospective cohort study to investigate the association between cell phones and brain cancer. This study included more than 700,000

¹¹ Ahlbom et al. *Epidemiology* 2009;20:639-52.

¹² Lagorio, S. and Rössli, M. (2014), Mobile phone use and risk of intracranial tumors: A consistency analysis. *Bioelectromagnetics*, 35: 79-90. doi: 10.1002/bem.21829

¹³ Swerdlow AJ, Feychting M, Green AC, et al. ICNIRP SCI Review; Mobile Phones, Brain Tumours and the Interphone Study: where are we now? *Environ Health Perspect.* 119;11 (2011): 1534-1538

¹⁴ Frei P, Poulsen A, Johansen C, et al. Use of mobile phones and risk of brain tumours: update of Danish cohort study. *BMJ.* 343 (2011): 1-9

¹⁵ Benson VS, Pirie K, Schuz J, et al. Mobile phone use and risk of brain neoplasms and other cancers: prospective study. *Int. J. Epidemiol.* (2013): 1-11

middle-age women in the UK. Information on mobile phone use was assessed prospectively by survey asked in 1999-2005 and again in 2009. In 1999, 34% of the participants reported that they had ever used a mobile phone; that number rose to 79% in 2005. Duration of cell phone use also rose dramatically over the study period – in 1999 3% reported duration of use of 5 or more years, while in 2005, 32% reported duration of 5 or more years. The prospective evaluation of information on cell phone use is a notable strength as it eliminates the potential for recall bias. The survey further collected information on potential confounding factors, which were adjusted for in mathematical models. Information on brain cancer incidence was ascertained prospectively from linkage to nationwide cancer registries. Use of the cancer registries, which were also used in the Danish study (see below), is a strength of the design, as it virtually eliminates the chance of loss to follow-up. There were 571 glioma tumors identified through 2009. There was no association for ever use of a mobile phone and glioma (RR = 0.91, 95% CI: 0.76-1.08). Moreover, there was no statistically significant association for glioma for daily use of a mobile phone or duration of use of 10+ years. In a follow up report, the study found no significantly increased risk for acoustic neuroma associated with long-term use (RR = 1.17, 95% CI: 0.6-2.27).¹⁶

The Benson study is arguably one of the strongest to assess the association between cellular telephone use and risk of brain cancer. Consistent with the prospective study from Denmark and many of the case-control studies, there was no association between mobile phone use and malignant brain cancer, regardless of duration of use, or exclusion of the first three years of follow-up. The collection of exposure data and other questionnaire data, prospectively, prior to development of disease lends further support to these findings.

Comparison of Actual Brain Cancer Incidence to Possible Elevated Risks of Brain Cancer Observed in Hardell's Epidemiologic Studies Among Cell Phone Users

Two publications have modeled what would have happened to the incidence of brain cancer in the US and the Nordic countries if the elevated risks of brain cancer observed among cell phone users in Hardell's studies were actually real. Basically, they conclude that if there were a true increase in glioma risk from cell phone use of the magnitude reported by Hardell, the effect of such a risk would have been detected in current US and Nordic cancer incidence data -- and no such increase has occurred, as I explained above.

Specifically, in 2012, using SEER data in the United States between 1992 and 2008, NCI researchers¹⁷ showed that the purported high relative risks reported in Hardell's epidemiologic studies are massively inconsistent with the actual pattern of use of cell phones and glioma incidence in the United States. They state, "[t]he results of [our] study suggest that, if the effects of mobile phones on malignant glioma risk are substantial, then the incidence rates in the US population would be far higher than those observed over most of the study period in 1992–2008 (fig 2)."¹⁸ These findings are supported by Deltour's report (discussed above) which uses a different modeling technique but reaches the same conclusion as Little, namely, the risks of glioma ob-

¹⁶ Benson, et. al. *International Journal of Epidemiology* 2013;1-1

¹⁷ Little, MP et. al. *BMJ*. 2012;344:e1147.

¹⁸ Little, MP, et. al., op.cit.

served in cell phone users in the Hardell data are massively incompatible with the actual numbers of brain cancers observed in the Nordic countries through 2008.

Epidemiology in children and adolescents and pregnant women

There is now one published epidemiologic study of cell phone use and brain cancer among children and adolescents. It concludes, "In summary, we did not observe that regular use of a mobile phone increased the risk for brain tumors in children and adolescents."¹⁹

There is also one published study examining the effect on neural development of prenatal exposure to cell phone use. The study concludes, "This study gives little evidence for an adverse effect of maternal cell phone use during pregnancy on the early neurodevelopment of offspring."²⁰

Animal Data

The human epidemiology provides the most information about the effect of wireless phone use on humans. However, animal studies can provide useful information because they permit controlled exposure conditions. Scientists have conducted multiple studies exposing animals to high doses of RF for the life of the animals – that is, while *in utero*, and then from birth to death. Overwhelmingly, these studies do not report an association between wireless phone exposure and cancer, (including tumor initiation, promotion or genotoxicity) even under these extreme exposure conditions. The results of these studies are consistent with those of the time-trend and epidemiologic studies on children and pregnant women that I discussed earlier.

The European Commission has three independent scientific committees that provide scientific advice to help guide policy around consumer safety, public health and the environment. In January of 2015, the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) as part of its overall evaluation of EMF and Health concluded with respect to animal data on carcinogenicity, "Overall, because a considerable number of well-performed studies using a wide variety of animal models have been mostly negative in outcome, **the animal studies are considered to provide strong evidence for the absence of an effect.**"²¹ (bolding mine)

The 2011 International Agency for Research on Cancer (IARC) classification of cell phones as showing limited evidence of carcinogenicity

In 2011, the International Agency for Research on Cancer (IARC) classified RF emissions from cell phones as "possibly carcinogenic." A subsequent article by John Boice, a widely respected expert in this field, addressed this IARC classification.²² After reviewing the body of research on potential health effects of cell phone RF emissions, Dr. Boice concluded:

Amid this encouraging evidence from human observational studies, coupled with

¹⁹ Aydin, op. cit.

²⁰ Vrijheid M, et.al. *Epidemiology* 2010; 21:259-262.

²¹ SCENIHR, potential health effects of exposure to electromagnetic fields (EMF), 27 January 2015

²² Boice, op.cit.

the negative findings from virtually all experimental animal and in vitro studies and the absence of any known biologic mechanism by which weak nonionizing radio waves emitted from cell phones could damage DNA and lead to cancer, it may therefore seem surprising that a monograph committee of the [IARC], an agency of the WHO, recently announced that cell phones may be “possibly carcinogenic to humans”. The change from [a prior classification of] “no conclusive evidence” to “possibly carcinogenic” was not new research, and it has understandably led to widespread public as well as media concern and confusion. The footnote accompanying the [IARC] press release [announcing the classification] is often missed – that a “possibly carcinogenic to humans” (2B) classification is based on “limited evidence of carcinogenicity” and that “chance, bias, or confounding could not be ruled out with reasonable confidence” for the few positive associations reported in the literature. A published summary of the IARC working group conclusions noted that some members found the epidemiologic evidence to be inadequate to support the 2B classification. Viewed in this context, “possibly carcinogenic” is not a signal to abandon mobile phones and return the landline phones. Rather it is a signal that there is very little scientific evidence as to the carcinogenicity of cell phone use.

The above assessment is similar to the recent assessment by ICNIRP that I have reported above.

WHO, IARC’s parent organization, noted in the press release accompanying IARC’s classification that “[a] large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk. To date, no adverse health effects have been established as being caused by mobile phone use.”

Following the IARC classification, the American Cancer Society noted “A 2B classification means that there could be some risk, but that the evidence is not strong enough to be considered causal, and needs to be investigated further.”²³ The NCI reiterated its conclusion that “although there have been some concerns that radiofrequency energy from cell phones held closely to the head may affect the brain and other tissues, to date there is no evidence from studies of cells, animals, or humans that radiofrequency energy can cause cancer.” The NCI added, “It is generally accepted that damage to DNA is necessary for cancer to develop. However, radiofrequency energy, unlike ionizing radiation, does not cause DNA damage in cells, and it has not been found to cause cancer in animals or to enhance the cancer causing effects of known chemical carcinogens in animals.”

In addition, the SCENIHR group referred to above also concluded this past January, “A working group at the International Agency for Research on Cancer (IARC) within the Monograph programme on the evaluation of carcinogenic risks to humans classified the epidemiological evidence for glioma and acoustic neuroma as limited and therefore evaluated RF fields as a possible human carcinogen (IARC, 2013). Based on studies published since that assessment (update of the Danish cohort study, the UK cohort

²³ American Cancer Society: Otis Brawley responds to IARC Classification of Cell Phones as Possible Carcinogenic. Accessed at <http://pressroom.cancer.org/index.php?s=43&item=312> on 05/29/2013. Last reviewed 05/31/2011

study, further case-control studies, the case-control study on mobile phones and brain tumours in children and adolescents, the consistency checks of brain tumour incidence rates using data from the Nordic countries and the US), the evidence for glioma has become weaker.”

Four years ago IARC's classification was based on weak and inconsistent evidence. Since then, any evidence for a possible association between cell phones and brain cancer has become even weaker, in fact, virtually non-existent.

Independent Reviews From Worldwide Government and Scientific Groups

Because of the wide-spread use of cell phones, the question of whether the radiofrequency from cell phones causes adverse health effects has been assessed in depth by numerous scientific organizations, agencies and other scientific reviewers in the United States and globally. There is consensus among these agencies and organizations that the scientific evidence does not support a causal relationship between cellular phone use and brain cancer.

One of the most recent reports comes from the British Health Protection Agency's independent Advisory Group on Non-Ionising Radiation (AGNIR)²⁴, which published a comprehensive report on this topic in April 2012. AGNIR reviewed the considerable scientific evidence from laboratory studies of cells and animals as well as experiments in humans and observational studies of humans that has accumulated since its initial report in 2003. Based on their comprehensive and critical review, the British Health Protection Agency reported that “there is no convincing evidence that RF field exposure below guideline levels affect health in adults or children.”²⁵ Specifically with regard to epidemiologic data, the report determined that “[t]he results of epidemiologic studies to date do not demonstrate that the use of mobile phones causes brain tumours..., nor do they suggest that causation is likely.”²⁶

The Norwegian Institute of Public Health concluded “overall, the available data show no association between exposure to RF fields from a mobile phone and fast-growing tumours, including gliomas in the brain.”²⁷

ICNIRP's 2011 report cited above concludes, “[a]lthough 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.”²⁸

²⁴ Health Effects from Radiofrequency Electromagnetic Fields Report of the Independent Advisory Group on Non-Ionising Radiation (2012). Accessed at http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317133827077 on 05/29/2013

²⁵ AGNIR, op. cit. p. 4

²⁶ AGNIR, op. cit. p. 320

²⁷ Low-level radiofrequency electromagnetic fields – an assessment of health risks and evaluation of regulatory practice: Report from the Expert Committee appointed by the Norwegian Institute of Health, commissioned by the Ministry of Health and Care Services and the Ministry of Transport and Communications (2012) at 34. Accessed at <http://www.fhi.no/dokumenter/545eea7147.pdf> on 05/29/2013.

In 2009 the European Commission's three independent scientific committees (SCENIHR) evaluated data from epidemiological, animal and *in vitro* studies and concluded "from three independent lines of evidence (epidemiological, animal and *in vitro* studies) that exposure to RF fields is unlikely to lead to an increase in cancer in humans."²⁹ In 2015, SCENIHR published an update and noted, "Overall, the epidemiological studies on mobile phone RF EMF exposure do not show an increased risk of brain tumours. Furthermore, they do not indicate an increased risk for other cancers of the head and neck region. Some studies raised questions regarding an increased risk of glioma and acoustic neuroma in heavy users of mobile phones. The results of cohort and incidence time trend studies do not support an increased risk for glioma while the possibility of an association with acoustic neuroma remains open. Epidemiological studies do not indicate increased risk for other malignant diseases, including childhood cancer."³⁰

Many other independent international scientific groups have assessed the state of the science on cell phones and brain cancer. After reviewing the evidence, these groups, have stated that it does not support the inference that radiofrequency from cell phones causes brain cancer. These groups include:

- o Health Council of the Netherlands
- o Royal Society of Canada for Health Canada
- o (Germany) Program Group Humans, Environment, Technology – Research Center Jülich
- o Nordic Radiation Safety Authorities – comprised of Swedish Radiation Safety Authority, Finnish Radiation and Nuclear Safety Authority, Norwegian Radiation Protection Authority, Icelandic Radiation Safety Authority, Danish National Board of Health
- o Australian Centre for Radio Frequency Bioeffects Research (ACRBR)
- o IEEE/ IEEE Committee on Man and Radiation (COMAR)

United States Government Agency Reviews

U.S. Government agencies that have reviewed the scientific evidence have reached the same conclusion. The federal agency with primary responsibility for regulating wireless phones, the FCC, has stated that "[t] here is no scientific evidence that proves that wireless phone usage can lead to cancer or a variety of other problems, including headaches, dizziness or memory loss."(www.fcc.gov/cgb/cellular.html#evidence). The FDA, which worked with the FCC in developing the current RF safety standard for wireless phones, has also stated "[t] he weight of scientific evidence has not linked cell phones with any health problems."

(<http://www.fda.gov/Radiation-EmittingProd->

²⁸ ICNIRP, *op. cit.*, p. 1534.

²⁹ Ahlbom A, Bridges J, De Jong W, et al. Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR): Health Effects of Exposure to EMF (2009) at 4

³⁰ SCENIHR, *op. cit.*

[ucts/RadiationEmittingProductsandProcedures/HomeBusinessandEntertainment/CellPhones/ucm116282.htm](http://www.cdc.gov/radiation/ProductsandProcedures/HomeBusinessandEntertainment/CellPhones/ucm116282.htm)). And the NCI states that concerns about the potential health effects of using cellular phones – “and specifically the suggestion that using a cell phone may increase a person’s risk of developing brain cancer – are not supported by a growing body of research on the subject.” (http://www.cancer.gov/ncicancerbulletin/NCI_Cancer_Bulletin_092308/page7)

The Centers for Disease Control (CDC) states that “although some studies have raised concerns about the possible risks of cell phone use, scientific research as a whole does not support a statistically significant association between cell phone use and health effects.”³¹ Similarly, the National Institute of Environmental Health Sciences (NIEHS) concluded “[t]he weight of the current scientific evidence has not conclusively linked cell phone use with any adverse health problems, but more research is needed.”³²

Conclusion

When I first testified to you five years ago I concluded that the scientific evidence does not indicate any need for cell phone RF-related legislation at the state level. In particular, I noted that there had been no increase in brain cancer rates in the United States through 2006. Five years later in the most recent national data (2011), the trend of the incidence of brain cancer in the United States continues flat to slightly decreasing. This is in spite of the fact that nearly every person in the United States uses a cell phone.

Five years ago, I was not alone. On March 2nd, 2010, the then director of the Maine CDC, **Dr. Dora Anne Mills**, said to this committee, “At this point in time, we believe the preponderance of evidence does not suggest a defined brain cancer or other cancer risk associated with the use of cell phones.” Her statement is even truer today, as it is supported by 5 more years of data

Today, as five years ago, the scientific evidence does not indicate any need for cell phone RF-related legislation at the state level. The weight of a large body of high quality scientific evidence, reviewed by many independent, authoritative government and scientific groups, shows no adverse health effects, such as brain cancer, from cell phone use.

The lack of association in the epidemiology and in the animal studies is consistent with the fact that brain cancer incidence, in both adults as well as children and adolescents, has not increased since wireless phone use has become common in the U.S as well as countries around the world. These data are also consistent with the fact that there is no known mechanism by which non-ionizing radiation from wireless phones could cause cancer. The FDA has stated “The scientific

³¹ Centers for Disease Control and Prevention: Radiation and Your Health. Accessed at http://www.cdc.gov/nceh/radiation/cell_phones_FAQ.html on 05/29/2013. Last Reviewed 06/03/2011.

³² National Institute of Environmental Health Sciences: Cell Phones. Accessed at <http://www.niehs.nih.gov/health/topics/agents/cellphones/> on 05/29/2013. Last Reviewed 04/01/2013.

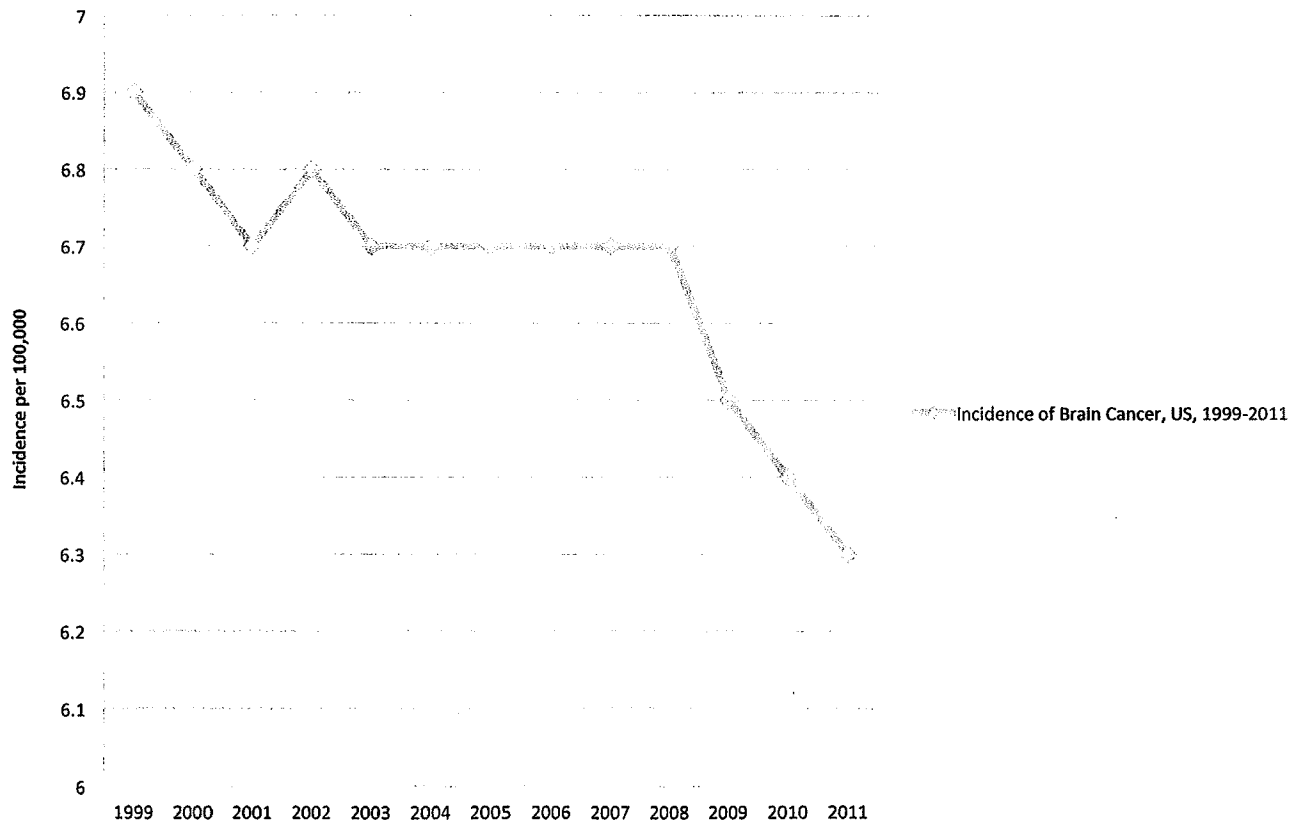
evidence does not show a danger to any users of cell phones from RF exposure, including children and teenagers.”³³

In addition, the available scientific evidence does not demonstrate any adverse health effects in the offspring of pregnant women. The lack of an increase in the incidence of brain cancer, the lack of any adverse effects in the totality of the animal data and the lack of a known mechanism all apply equally to pregnant women.

March 31, 2015

³³See <http://www.fda.gov/Radiation-EmittingProductsandProcedures/HomeBusinessandEntertainment/CellPhones/ucm116331.htm>

Incidence of Brain Cancer, US, 1999-2011, Ages 15-79 Years



United States Cancer Statistics, 1999-2011 Incidence Results

Incidence of Brain Cancer, US, 1999-2011

Year	Count	Population	Age-Adjusted Rate Per 100,000
1999	13,030	190,886,392	6.9
2000	13,338	198,122,644	6.8
2001	13,153	197,987,145	6.7
2002	13,750	202,717,083	6.8
2003	14,446	215,137,122	6.7
2004	15,041	222,079,109	6.7
2005	15,171	224,543,865	6.7
2006	15,430	227,349,157	6.7
2007	15,699	229,822,971	6.7
2008	15,903	232,260,383	6.7
2009	15,931	234,588,936	6.5
2010	15,954	236,823,371	6.4
2011	15,840	236,818,810	6.3
Total	192,686	2,849,136,988	6.7

Notes:**Caveats:**

Data are suppressed if fewer than 16 cases are reported in the specific category. Data for the "Asian / Pacific Islander", "American Indian or Alaska Native", and the "Other Races Combined" race categories are suppressed at the Metropolitan Statistical Area level for populations less than 50,000 persons. Data are suppressed at the state level for certain race and ethnicity groups: 1) American Indian or Alaska Native data are suppressed at the state level for Delaware, Georgia, Illinois, Kansas, Kentucky, Missouri, New Jersey, New York, and South Carolina; 2) Asian or Pacific Islander data are suppressed at the state level for Delaware, Illinois, Kansas, Kentucky, Missouri, and South Carolina; 3) Hispanic data are suppressed at the state level for Delaware, Kentucky, Massachusetts, Missouri, Pennsylvania, and South Carolina. [More information.](#)

Data are from selected statewide and metropolitan area cancer registries that meet data quality criteria.

For the 2005 year, the Census Bureau estimates that 203,937 persons were displaced from Alabama, Louisiana, Mississippi and Texas due to Hurricanes Katrina and Rita. CDC WONDER does not include the displaced persons in the 2005 population counts for these states, nor are these counts included in the summary populations for the affected division, regions or national population. However, the USCS web site does include these displaced persons in the national population figures for 2005.

Information on primary site, behavior, and histology was coded according to the International Classification of Diseases for Oncology, Third Edition (ICD-O-3) and categorized according to the revised SEER recodes dated January 27, 2003, which define standard groupings of primary cancer sites.

Help: See [United States Cancer Statistics, 1999-2011 Incidence Documentation](#) for more information.

Query Date: Mar 28, 2015 12:25:57 PM

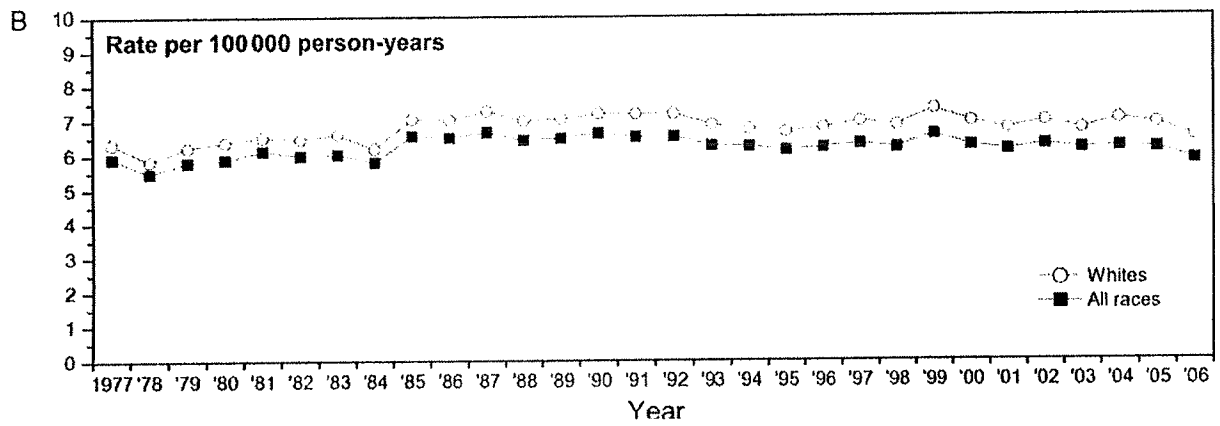
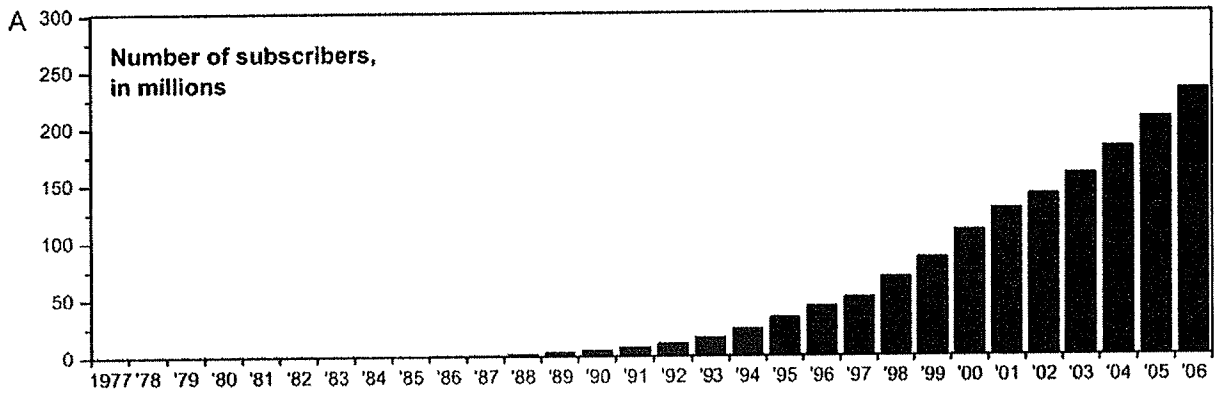
Suggested Citation:

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Query Criteria:

Title: Incidence of Brain Cancer, US, 1999-2011
Age Group: 15-19 years, 20-24 years, 25-29 years, 30-34 years, 35-39 years, 40-44 years, 45-49 years, 50-54 years, 55-59 years, 60-64 years, 65-69 years, 70-74 years, 75-79 years
Cancer Sites: Brain
Ethnicity: All
Race: All
Sex: All
State: All
Year: All, 1999 to 2011
Group By: Year
Show Totals: True
Show Zero Values: False
Show Suppressed: False
Calculate Rates Per: 100,000
Standard Population: 2000 U.S. Std. Million

National Cancer Institute Data



Incidence of Brain Cancer, US, 1999-2011, Ages 15-79 Years

