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Before the

Subcommittee on Labor, Health and Human Services, and Education, and Related Agencies
Committee on Appropriations
United States Senate

Hearing on The Health Effects of Cell Phone Use

Monday, September 14, 2009
Dirksen Senate Office Building, Room 138, 2 p.m.

Mr. Chairman and distinguished Members of the Subcommittee: My name is Olga Naidenko, and I am a Senior Scientist at Environmental Working Group (EWG), a nonprofit research and advocacy organization based in Washington, DC; Ames, Iowa; and Oakland, California. I thank the members of the subcommittee for holding this important hearing and for the opportunity to testify.

Last week, EWG released the results of a 10-month investigation of more than 200 peer-reviewed studies, government advisories, and industry documents on the safety of cell phone radiation. We found that the studies amassed during the first two decades of cell phone use produced conflicting results and few definitive conclusions on cell phone safety. But the latest research, in which scientists are for the first time able to study people who have used cell phones for many years, suggests the potential for serious safety issues.

Studies published over the past several years find significantly higher risks for brain and salivary gland tumors among people using cell phones for 10 years or longer. The state of the science is provocative and troubling, and more research is essential. We at Environmental Working Group are still using our cell phones, but we also believe that until scientists know much more about cell phone radiation, it's smart for consumers to buy phones with the lowest emissions.

As of December 2008, U.S. wireless subscribers numbered 270.3 million -- 87 percent of Americans -- a 30 percent jump in three years (CTIA 2009). Some 60 percent of the global population -- four billion people -- subscribe to wireless services (ITU 2008). As the market for new devices has grown, so has the urgency that cell phone safety be well understood, and that cell phone radiation standards be sufficient to protect public health.

In this testimony we highlight five key areas of concern:

- Consumers have a right to know the level of radiation their phones emit;
- Latest science points to potential risks to children's health;
- Federal standards for cell phone radiation need to be modernized;
- What consumers can do to reduce exposures to cell phone radiation;
- EWG's recommendations to the government, industry, and the public.

1. Consumers have a right to know the level of radiation their phones emit

EWG advocates that cell phone companies label their products' radiation output so that consumers can make informed choices at the point of sale, and that the government require this disclosure. Currently, most people are given no information at all about radiation emissions when they purchase a phone.

To fill this information void, EWG's research team created a user-friendly, interactive online guide to cell phone emissions, covering over 1,200 phones currently on the market. Consumers can use this free online database to make informed decisions about which cell phones to buy. The EWG guide uses easy-to-read graphics to illustrate each phone's radiofrequency emissions, enabling consumers to make quick comparisons of radiation output of various wireless devices.

In the 64 hours following the publication of our science review and cell phone radiation database, 442,000 people accessed these materials on our website, collectively viewing 1.4 million online pages. During those same 3 days our findings were reported in 100 news articles and in national and local broadcast news, including the *New York Times*, *NBC Nightly News*, *WebMD*, and *USA Today*. This powerful response from the public and from news media outlets reflects consumers' keen interest in the issue of cell phone safety. Clearly, people are eager to know if cell phones are safe and how they can protect themselves and their families from potential adverse effects of excessive exposure to cell phone radiation.

2. The latest science points to potential risks to children's health

Prior to 2003, studies of cancer risk and cell phone use produced conflicting results. The Food and Drug Administration (FDA) told consumers that scientists had found no harmful health effects from exposure to cell phone emissions (FDA 2003). But FDA's assurances were based on studies of people who had used cell phones for just 3 years, on average (FDA 2003), not long enough to develop cancer. At that time, studies had not addressed the risks of longer-term cell phone radiation exposures. The research gap is closing. Recent studies find significantly higher risks for brain and salivary gland tumors among people using cell phones for 10 years or longer. The state of the science is provocative and troubling, especially for the health of children. Among recent findings are the following:

- A joint study by researchers in Denmark, Finland, Norway, Sweden and the United Kingdom found that people who had used cell phones for more than 10 years had a significantly increased risk of developing glioma, a usually malignant brain tumor, on the side of the head they had favored for cell phone conversations (International Agency for Research on Cancer (IARC) 2008; Lahkola 2007).
- French and German scientists reported an increased risk of glioma for long-term cell phone users (Hours 2007; Schuz 2006). Analysis of all published cell phone-brain tumor studies found that people who had used a cell phone for 10 or more years, the overall risk for developing a glioma on the cell phone side of the head increased by 90 percent (Hardell 2009; Kundi 2009).
- Cell phone use for 10 years and longer has been also associated with significantly increased risk of acoustic neuroma, a type of benign brain tumor, on the primary side of cell phone use (International Agency for Research on Cancer (IARC) 2008; Lonn 2004; Schoemaker 2005). An extensive review of published studies of acoustic neuroma found that long-term

cell phone users had a 60 percent greater risk of being diagnosed with the disease (Hardell 2009; Kundi 2009).

- A study from Israel reported an association between frequent and prolonged mobile phone use and parotid (salivary) gland tumors (Sadetzki 2008). Scientists analyzing data from Sweden and Denmark combined found that people who had used cell phones for at least 10 years ran an increased risk of benign parotid gland tumors (International Agency for Research on Cancer (IARC) 2008; Lonn 2006).

The National Research Council (NRC) has observed that "with the rapid advances in technologies and communications utilizing [radiation in the range of cell phone frequencies], children are increasingly exposed... at earlier ages (starting at age 6 or before)" (NRC 2008). Research by France Telecom scientists showed that under standard conditions of use, twice as much cell phone radiation would penetrate a child's thinner, softer skull than an adult's (Wiat 2008). Children will be exposed to cell phone radiation for more years and therefore in greater total amounts than the current generation of adults (NRC 2008).

Children are likely to be more susceptible than adults to effects from cell phone radiation, since the brain of a child is still developing and its nervous tissues absorb a greater portion of incoming radiation compared to that of an adult (Conil 2008; de Salles 2006; Gandhi 1996; Kang 2002; Martinez-Burdalo 2004; Wang 2003; Wiat 2008). Much more research is essential. However, in response to the information already available over the potential health risks of cell phone emissions, government agencies in Germany, Switzerland, Israel, United Kingdom, France, and Finland and the European Parliament have recommended actions to help consumers reduce exposures to cell phone radiation, especially for young children. Among warnings issued by government agencies are the following:

- **United Kingdom Department of Health:** "UK Chief Medical Officers strongly advise that where children and young people do use mobile phones, they should be encouraged to: use mobile phones for essential purposes only; keep all calls short - talking for long periods prolongs exposure and should be discouraged." (UK Department of Health 2005).
- **Canada - City of Toronto Department of Public Health:** "Today's children have started to use cell phones at a younger age, therefore their lifetime exposure to cell phone RFs will likely be greater. As a result, the chances that a child could develop harmful health effects from using a cell phone for a long time may be greater... Toronto Public Health is recommending that children, especially pre-adolescent children, use landlines whenever possible, keeping the use of cell phones for essential purposes only, limiting the length of cell phone calls and using headsets or hands-free options, whenever possible." (Toronto Public Health 2008a, b).
- **Finland - Finnish Radiation and Nuclear Safety Authority:** "It would be good to restrict children's use of mobile phones." "Precaution is recommended for children as all of the effects are not known... Parents are recommended to guide their children to use a hands-free that minimises the exposure of head significantly. When using a hands-free it is recommended to keep the mobile phone at least a few centimetres away from the body." (STUK (Finnish Radiation and Nuclear Safety Authority) 2009).

In contrast, the two U.S. federal agencies that regulate cell phones, the FDA and the Federal Communications Commission (FCC), have all but ignored evidence that long term cell phone use may be risky.

3. Federal standards for cell phone radiation need to be modernized

The FCC set cell phone radiation standards 17 years ago, when few people used cell phones. These standards fail to provide an adequate margin of safety for cell phone radiation exposure and do not account for risks to children. The FCC standards closely follow the 1992 recommendations of the Institute of Electrical and Electronics Engineers (IEEE) (FCC 1997). The FCC adopted IEEE's proposal to allow 20 times more radiation to the head than the average amount allowed for the whole body, even though the brain may well be one of the most sensitive parts of human body with respect to radiofrequency radiation and should have more protection. EWG's conclusion: current U.S. cell phone radiation standards are outdated and may not be sufficiently protective. EWG urges the FDA and the FCC to upgrade its standards to take account of the newest scientific evidence and also increasing cell phone use by children.

4. What consumers can do to reduce exposures to cell phone radiation

EWG recommends a number of simple actions consumers can take to reduce exposures to cell phone radiation. We recommend these simple precautionary measures until the science on cell phone risks is settled, and until the federal government modernizes current radiation limits to reflect the latest research.

- **Use a low-radiation phone.** Consumers can find radiation emissions for their current phone on EWG's database (www.ewg.org/cellphone-radiation), in their user's manual, or by contacting the manufacturer. EWG's database lists alternate, low-radiation phones, allowing people to consider purchasing a phone that emits the lowest radiation possible and still meets their needs.
- **Use a headset or speakers.** Headsets emit much less radiation than phones. Experts are split on whether wireless or wired is safer. Some wireless headsets emit continuous, low-level radiation, so EWG advises removing the headset from the ear between calls. Using a phone in speaker mode also reduces radiation to the head.
- **Listen more, talk less.** Cell phones emit radiation to transmit voice or text messages, but not to receive messages. Listening more and talking less reduces exposures.
- **Hold phone away from the body.** Holding the phone away from the torso when talking (while using the headset or speaker) reduces radiation exposures. EWG advises against holding the phone against the ear, in a pocket, or on the belt where soft body tissues absorb radiation.
- **Choose texting over talking.** Phones use less power (less radiation) to send text than voice. And unlike speaking with the phone at the ear, texting keeps radiation away from the head.
- **Stay off the phone if the signal is poor.** Fewer signal bars on the phone means that it emits more radiation to get the signal to the tower. EWG recommends that people make and take calls when the phone has a strong signal.
- **Limit children's phone use.** Young children's brains absorb twice the cell phone radiation as an adult's. EWG joins health agencies in at least six countries in recommending limits for children's phone use, such as for emergency situations only.

- **Skip the “radiation shield.”** Radiation shields such as antenna caps or keypad covers reduce the connection quality and force the phone to transmit at a higher power with higher radiation.

5. Recommendations

The government should invest in additional research on the health effects of cell phone radiation, with special emphasis on children and teens.

The government should require industry to make cell phone radiation level information available at the point of sale, so consumers can make informed decisions about the phones they buy.

Given the troubling questions raised by the research thus far, the cell phone industry should not wait for government action, but instead, offer consumers phones that operate with the least possible radiation, and should offer radiation information at the point of sale.

In the meanwhile, cell phone users can protect themselves and their families by buying low-radiation phones. Cell phone users can also reduce radiation exposures by using their phone in speaker mode or with a headset.

In conclusion, EWG strongly believes that the government should support additional research into this important health question, and that the public has the right to know what levels of radiation they may be exposed to, what may be the potential risks, and what precautionary measures they can take to protect themselves and their families from any adverse health effects of cell phone radiation.

Thank you for your time. I welcome the opportunity to answer any questions you may have.

EXHIBIT A

REFERENCES

- Conil E, Hadjem A, Lacroux F, Wong MF, Wiart J. 2008. Variability analysis of SAR from 20 MHz to 2.4 GHz for different adult and child models using finite-difference time-domain. *Phys Med Biol* 53(6): 1511-25.
- CTIA. 2009. Wireless Quick Facts. Year End Figures. Available: http://www.ctia.org/media/industry_info/index.cfm/AID/10323 [accessed September 2 2009].
- de Salles AA, Bulla G, Rodriguez CE. 2006. Electromagnetic absorption in the head of adults and children due to mobile phone operation close to the head. *Electromagn Biol Med* 25(4): 349-60.
- FCC. 1997. Federal Communications Commission Office of Engineering & Technology. Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. OET Bulletin 65 Edition 97-01 Available: <http://www.fcc.gov/oet/rfsafety/> [accessed December 10 2008].
- FDA. 2003. Cell Phone Facts. Consumer Information on Wireless Phones. Questions & Answers. Available: <http://web.archive.org/web/20031205121949/www.fda.gov/cellphones/qa.html> [accessed June 10 2009].
- Gandhi OP, Lazzi G, Furse CM. 1996. Electromagnetic absorption in the human head and neck for mobile telephones at 835 and 1900 MHz. *IEEE Transactions on Microwave Theory and Techniques* 44(10): 1884 - 97.
- Hardell L, Carlberg M, Hansson Mild K. 2009. Epidemiological evidence for an association between use of wireless phones and tumor diseases. *Pathophysiology* 116(2-3): 113-22.
- Hours M, Bernard M, Montestrucq L, Arslan M, Bergeret A, Deltour I, et al. 2007. [Cell Phones and Risk of brain and acoustic nerve tumours: the French INTERPHONE case-control study]. *Rev Epidemiol Sante Publique* 55(5): 321-32.
- International Agency for Research on Cancer (IARC). 2008. INTERPHONE study results latest update - 8 October 2008. Available: <http://www.iarc.fr/en/research-groups/RAD/current-topics.php> [accessed June 8, 2009].
- ITU. 2008. International Telecommunication Union Press Release. Worldwide mobile cellular subscribers to reach 4 billion mark late 2008. Available: http://www.itu.int/newsroom/press_releases/2008/29.html [accessed March 19 2009].
- Kang G, Gandhi OP. 2002. SARs for pocket-mounted mobile telephones at 835 and 1900 MHz. *Phys Med Biol* 47(23): 4301-13.
- Kundi M. 2009. The Controversy about a Possible Relationship between Mobile Phone Use and Cancer. *Environ Health Perspec* 117(3): 316-24.
- Lahkola A, Auvinen A, Raitanen J, Schoemaker MJ, Christensen HC, Feychting M, et al. 2007. Mobile phone use and risk of glioma in 5 North European countries. *Int J Cancer* 120(8): 1769-75.
- Lonn S, Ahlbom A, Christensen HC, Johansen C, Schuz J, Edstrom S, et al. 2006. Mobile phone use and risk of parotid gland tumor. *Am J Epidemiol* 164(7): 637-43.

Lonn S, Ahlbom A, Hall P, Feychting M. 2004. Mobile phone use and the risk of acoustic neuroma. *Epidemiology* 15(6): 653-9.

Martinez-Burdalo M, Martin A, Anguiano M, Villar R. 2004. Comparison of FDTD-calculated specific absorption rate in adults and children when using a mobile phone at 900 and 1800 MHz. *Phys Med Biol* 49(2): 345-54.

NRC. 2008. National Research Council. Identification of Research Needs Relating to Potential Biological or Adverse Health Effects of Wireless Communication. Available: http://www.nap.edu/catalog.php?record_id=12036 [accessed December 10 2008].

Sadetzki S, Chetrit A, Jarus-Hakak A, Cardis E, Deutch Y, Duvdevani S, et al. 2008. Cellular phone use and risk of benign and malignant parotid gland tumors--a nationwide case-control study. *Am J Epidemiol* 167(4): 457-67.

Schoemaker MJ, Swerdlow AJ, Ahlbom A, Auvinen A, Blaasaas KG, Cardis E, et al. 2005. Mobile phone use and risk of acoustic neuroma: results of the Interphone case-control study in five North European countries. *Br J Cancer* 93(7): 842-8.

Schuz J, Bohler E, Berg G, Schlehofer B, Hettinger I, Schlaefel K, et al. 2006. Cellular phones, cordless phones, and the risks of glioma and meningioma (Interphone Study Group, Germany). *Am J Epidemiol* 163(6): 512-20.

STUK (Finnish Radiation and Nuclear Safety Authority). 2009. Statement of Finnish Radiation and Nuclear Safety Authority (STUK) concerning mobile phones and health on 7th January 2009. Available:

http://www.stuk.fi/sateilytietoa/sateilyn_terveysvaikutukset/matkapuhelin_terveysvaikutus/en_GB/stukin_matkapuhelinkannanotto/ [accessed March 20 2009].

Toronto Public Health. 2008a. Cell Phone Use by Children and Youth. Board of Health report (May 2008). Available: <http://www.toronto.ca/health/hphe/radiation/radiofrequency.htm> [accessed March 29 2009].

Toronto Public Health. 2008b. Fact Sheet - Children and Safe Cell Phone Use (July 2008). Available: <http://www.toronto.ca/health/hphe/radiation/radiofrequency.htm> [accessed March 29 2009].

UK Department of Health. 2005. Mobile Phones and Health. Available:

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4006938 [accessed March 29 2009].

Wang J, Fujiwara O. 2003. Comparison and Evaluation of Electromagnetic Absorption Characteristics in Realistic Human Head Models of Adult and Children for 900-MHz Mobile Telephones *IEEE Transactions on Microwave Theory and Techniques* 51(3): 966-70.

Wiat J, Hadjem A, Wong MF, Bloch I. 2008. Analysis of RF exposure in the head tissues of children and adults. *Phys Med Biol* 53(13): 3681-95.