E-00000C-11-0328

OPEN MEETING AGENDA

ORIGINAL

PRE-FILED TESTIMONY
OF DE-KUN LI, MD, PhD, MPH
MPUC Docket No. 2011-00262

Q. Please state your name and business address.

A. My name is De-Kun Li, MD, PhD, MPH. My address is:

Division of Research
Kaiser Foundation Research Institute
Kaiser Permanente
2000 Broadway
Oakland, CA 94612

Q. Briefly state your educational background and current employment.

A. I completed my medical training and a master's degree in public health at Shanghai Medical University (now part of Fudan University), Shanghai, China. I received my PhD in epidemiology from the University of Washington, Seattle.

My current position is senior scientist (Research Scientist III, equivalent to Full Professor) at the Division of Research, Kaiser Permanente Northern California. I am also a faculty member in the Department of Health Research & Policy of Stanford University. I have supervised doctoral students from the departments of epidemiology at UCB (University of California, Berkeley) and UCLA (University of California, Los Angeles).

Q. Briefly describe your professional experience.

A. I am a reproductive and perinatal epidemiologist with extensive experience conducting epidemiologic studies related to pregnancy outcomes and early childhood diseases including miscarriage, preeclampsia, sudden infant death syndrome (SIDS), birth defects, preterm delivery, low birthweight, and childhood asthma and obesity. My recent research on environmental exposures during pregnancy has focused on Bisphenol-A (BPA) and electromagnetic fields (EMF) and their impact on reproductive systems and adverse pregnancy outcomes. I have published five papers on the health effects of exposure to magnetic fields in peer-reviewed journals (see my *curriculum vitae*, attached as Exhibit A). The two most recent articles published in the *Archives of Pediatrics and Adolescent Medicine* (a *JAMA* journal) in 2011 and *Scientific Reports* (a *Nature* journal) in 2012 were prospective studies examining the effect of maternal exposure to magnetic fields during pregnancy on the risks of asthma and childhood obesity in

offspring during a follow-up period of 13 years. News coverage of the published papers can be obtained by a Google search of my name.

In addition to EMF health effects, my research areas include:

- Health effects of endocrine disruptors, especially Bisphenol-A (BPA), on male and female reproductive systems
- Pharmacological effects of medication use during pregnancy on pregnancy outcomes
- Genetic determinants of pregnancy outcomes
- Risk factors for poor semen quality
- Risk factors for infertility, miscarriage, preterm delivery, preeclampsia, sudden infant death syndrome, cerebral palsy, birth defects, pediatric diseases, including childhood cancer and neurological disorders; autoimmune diseases in relation to maternal-fetal interaction, and breast cancer.

Q. Are you a member of any professional organizations or have other professional affiliations?

A. I am currently the associate editor of the American Journal of Epidemiology.

B. I have been invited to serve on multiple *NIH* expert review panels (NIH Study Sections) including those sponsored by National Institute of Environmental Health Sciences (*NIEHS*), National Institute of Child Health and Human Development (*NICHD*), and National Institute of Occupational Safety and Health (*NIOSH/CDC*).

C. I have also been invited by the *National Academy of Science* to be one of the panel members in the U.S.-China Collaboration of Biomedical Research.

D. I have been a member of many professional societies including: International Society of Environmental Epidemiology, Society for Epidemiological Research, American College of Epidemiology, Teratology Society, International Society for Pharmacoepidemiology, and Society of Public Health

Q. Have you authored any papers or journal articles?

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A. I have published extensively with more than 70 publications in peer – reviewed journals. More importantly, I first-authored 36 of these publications. Many of these publications have been widely reported and covered by national, international, and local news media including recent studies of:

a. Maternal exposure to magnetic fields during pregnancy and the risks of childhood obesity and asthma in offspring during 13 years of follow up

b. High level of exposure to magnetic fields and poor semen quality

c. Exposure to Bisphenol-A (BPA) and reduced male sexual function, poor semen quality

d. Exposure to BPA during pregnancy and increased risk of low birthweight and mal-development of fetal genitalia

e. Caffeine intake during pregnancy and miscarriage risk

f. Pacifier use and use of a fan in relation to reduced SIDS risk

g. Depression during pregnancy and preterm delivery.

Q. Have some research and epidemiological studies shown negative results for adverse health effects associated with RF exposure?

A. My research has been focused on power-line frequency EMF exposure, not RF EMF exposure. However, I am aware of the controversies about the health effect of RF EMF exposure, mostly from cell phone-related exposure, and reports of a potential increased risk of brain tumors associated with long-term (> 10 years) use of cell phones. Although the number of studies examining RF EMF health effect remains limited, the existing reported studies are riddled with methodological problems. Chief among them are retrospective designs [trying to ascertain RF EMF exposure *after* outcomes (e.g., brain cancer) had already occurred], and short term use of cell phone. Many of the outcomes examined (e.g., cancer) have a long latency period and take decades to show symptoms. Thus, those studies of short-term exposure which claim no effect on disease outcomes that take a long time to develop are irrelevant in determining RF EMF health effect.

B. The science of understanding EMF health effects is still at an early stage. Like studying any other environmental risk factors, we will have to deal with the uncertainty of EMF safety for some time to come. Such

uncertainty means that nobody can make a definitive statement about RF EMF health effect, whether safe or not safe. In other words, while nobody can make a final conclusion about RF EMF adverse health effects, nobody can make a claim that RF EMF is safe either. Any such claim that RF EMF is safe is either ignorant or misleading.

C. Among the limited number of studies examining RF EMF health effect, they were almost exclusively focused on cell phone use. I am not aware of any studies conducted by any entities to demonstrate that use of the smart meter with massive installation in residential areas is safe for the human population.

D. Given the uncertainty about RF EMF health effects, the question becomes whether it is the consumers responsibility to demonstrate the safety of a product by being exposed to it and becoming a victim or casualty (e.g., brain cancer); or the responsibility of the producer of smart meters to demonstrate its safety before releasing it to the public. FDA requires pharmaceutical companies to demonstrate that a new medication is safe before it is allowed to be released on the market. Medications usually have therapeutic value for patients and only those with certain conditions are exposed to them (affected size is really small for most medications). For a product like smart meters that almost everyone is exposed to, demonstrating its safety is the paramount responsibility of the producer.

Q. Please describe your prospective epidemiological studies related to RF exposure.

A. Over 13 years ago, we conducted a study to examine the health effect of exposure to magnetic fields during pregnancy among more than 1,000 pregnant women. It was a prospective study, meaning magnetic exposure was measured during pregnancy ***before*** the outcomes of interest occurred, compared to many retrospective studies of RF EMF about cell phone use. Our study was also based on objective measure of magnetic fields, meaning that we asked participating women to wear a meter that captured magnetic fields from all sources, rather than based on participant recall as in most RF EMF studies of cell phone use.

B. We first examined the health effect of magnetic fields on the risk of miscarriage. We published a paper in 2002 showing that women with higher exposure level to magnetic fields had almost twice the risk of miscarriage. The finding was widely reported by the international media at that time. BBC sent a reporting crew specifically to cover the story.

C. We then followed the offspring for up to 13 years. We published two papers, one in 2011 and another in 2012 reporting that children of mothers

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who were exposed to higher levels of magnetic fields during pregnancy had a higher risk of childhood obesity and asthma (3-6 times higher in some cases). There was a dose-response relationship, meaning that the higher the maternal exposure level of magnetic fields was during pregnancy, the higher the risk of asthma or childhood obesity in their offspring. The papers were widely covered by the news media.

D. The important strengths of both findings are the prospective design and objective measure of exposure levels of magnetic field, both of which would lead to more accurate measure of magnetic field level. When magnetic fields were not measured correctly, like in those studies based on participants' recall, the resultant finding is "no adverse effect" due to what we call ***non differential misclassification of exposure***.

Q. Are there plausible mechanisms by which non-thermal biological effects associated with RF exposure could result in cancer or other adverse health effects?

A. Due to the limited research effort, the underlying mechanisms of the potential EMF health effect are not totally understood at present. Skeptics have been focused on the EMF thermal effect, especially those who are NOT in the profession of biomedical research, such as physicists or engineers. It is now known that EMFs can interfere with the human body through multiple mechanisms. For example, it has been demonstrated that communication between cells depends on internal EMF signals, likely at a very low level. External EMFs could conceivably interfere with normal cell communication, thus disrupting normal cell differentiation and proliferation. Such disturbance could interfere with fetal development and lead to miscarriage, birth defects, and cancer. However, demonstrating such a mechanism will take time and effort through funded research.

Q. In your opinion, does the state of the science support a public policy decision concluding that exposure to RF from wireless smart meters is safe?

A. No. As stated above, at this point, the safety of RF EMF exposure is uncertain, largely due to a lack of research effort. Given the ubiquitous RF EMF exposure and its potential impact on large populations, the resources for studying RF EMF health effect are relatively limited. In fact, emerging reports, though still limited, are starting to show possible links to adverse health outcomes, especially with long-term exposure.

B. I am not aware of any studies that have shown that exposure to smart meters is safe for the human population. Anyone who wants to install smart meters to every household needs to conduct studies to demonstrate that such massive installation is safe and will have no effect on the risk of

cancer, miscarriage, childhood obesity and asthma, autoimmune diseases, etc.

C. Exposure to smart meter RF EMF is different from exposure to cell phone RF EMF in several important ways:

a. First, cell phone use is usually for a short duration. However, a smart meter, if installed near or outside the location within a residence that people are frequently occupying (such as bedrooms, living rooms, nurseries, etc.,) creates exposure to RF EMF that could last for many hours.

b. Use of cell phones is a voluntary exposure. One can choose not to use a cell phone. Vulnerable populations like infants and young children currently are not exposed to cell phone RF EMF in most cases. However, every resident, including infants, pregnant women and the fetus, in a household will be exposed to RF EMF from smart meters if installed nearby. Given that installation of smart meters is mandatory in most places, RF EMF exposure from smart meters is an "*involuntary*" exposure. Based on the principle of risk assessment, involuntary exposures require more stringent safety standards.

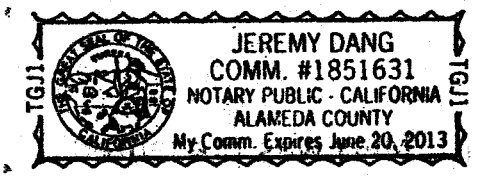
c. Because of the nature of involuntary exposure, many susceptible populations including pregnant women, young children, and those who are sensitive to RF EMF are being equally exposed. Susceptible populations usually have much lower thresholds of exposure level.

Dated this 3rd day of December, 2012.

De-Kun Li

STATE OF CALIFORNIA
ALAMEDA, ss: December 3, 2012

Personally appeared the above-named De-Kun Li, and stated under oath that the foregoing Affidavit made by him is true and based upon his own personal knowledge, information or belief, and so far as upon information and belief, he believes the information to be true. Before me, Jeremy Daly, Notary Public



Notary Public/Attorney-at-Law

Jeremy Dang

Name Typed or Printed

My Commission Expires: 06/20/2013

Docket No. E-00000C-11-0328

Note

The Expert testimony of De-Kun Li, MD, PhD, MPH was presented for the Maine Smart Meter Appeal.

http://www.mainecoalitiontostopsmartmeters.org/wp-content/uploads/2013/01/Exhibit-2-De-Kun-Li-Web.pdf

De-Kun Li's Curriculum Vita, is available in the 13 pages following this document on the above listed website.

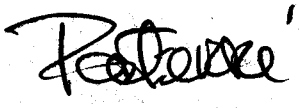
De-Kun Li's testimony is listed as part of the Expert Testimony of scientists engaged in research on the biological effects of low-level RF or those engaged in public health or policy in this arena.

Maine Smart Meter Appeal Summary History [as of 1/29/13] Ed Friedman

A brief description of the "10" Person Complaint" with the Maine Public Utilities Commission [PUC], the 10/31/11, Complainants filed a Notice of Appeal to the Maine Supreme Judicial Court, and subsequent events, can be viewed on the following website:

http://www.mainecoalitiontostopsmartmeters.org/2013/02/introduction-to-our-puc-filings-of-expert-and-lay-witness-testimony/

Respectfully Submitted,



Patricia Ferre