

Overloading of Towns and Cities with Radio Transmitters (Cellular Transmitter): a hazard for the human health and a disturbance of eco-ethics

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1. A Very Serious Warning 36 Years Ago

“The electromagnetic radiations emanating for radar, television, communications systems, microwave ovens, industrial heat-treatment systems, medical diathermy units, and many other sources permeate the modern environment, both civilian and military.”

“Unless adequate monitoring and control based on a fundamental understanding of biological effects are instituted in the near future, in the decades ahead, man may enter an era of energy pollution of the environment comparable to the chemical pollution of today.”

“The consequences of undervaluing or misjudging the biological effects of long-term, low-level exposure could become a critical problem for the public health, especially if genetic effects are involved.”

These quotations are excerpts from the US government report “Program for Control of Electromagnetic Pollution of the Environment”, which was published in December 1971. The government report was drafted starting in December 1968 by an expert group made up of nine people, “The Electromagnetic Radiation Management Advisory Council”. “The President’s Office of Telecommunications Policy” issued the order. This report was an urgent warning for the future.

2. Today (2007): Ignoring This Warning and Irresponsible Deception

About 36 years have passed since the publishing of this report. Unfortunately, this urgent warning, which is scientifically well-founded, is currently not taken seriously. The beauty of landscapes and cities are spoiled with “forests of radiant radio antennas” in order to serve a new addiction of people: telecommunication. From this unethical, environment-disfiguring antenna forest, people are continuously bombarded by invisible, imperceptible, health-damaging, stressing, high-frequency, electromagnetic radiations.

As predicted 36 years ago in the US government report, our planet today is more “contaminated” by “electronic smog” than with the chemistry that already heavily strains people. Those responsible have unfortunately still not considered a possible double strain of these two harmful factors.

The telecommunications and microwave industry even contends that these high-frequency electromagnetic radiations are not harmful for people’s health. That is irresponsible deception. Facts support the opposite.

3. Radio Wave or Microwave Sickness Known for 75 Years

Seventy-five years ago in August 1932, the German doctor Erwin Schliephake published scientific data in the German Medical Weekly about radio transmitter-induced “microwave” or “radio wave sickness” with the following symptoms: severe tiredness and fatigue during the day, fitful sleep in the night, headaches to the point of intolerability, and high susceptibility to infection.

These symptoms, which are also observed in neurasthenia (enervation), were not to be traced back to the thermal effects, but rather to the athermal effects of high-frequency

electromagnetic radiation, according to Schliephake's view. The health-damaging effect of high-frequency electromagnetic and electric radiation was reproduced in thousands of investigations.

This microwave sickness, induced by athermal high-frequency EMF radiation, was verified by the scientific work of the Russian author Zinaida Gordon from the Moscow Institute for Industrial Hygiene and Occupational Diseases, in 1966 in the Russian language and in 1970 in the English language, among many others. She examined more than 1,000 workers who worked at radio installations, electric utilities, radar stations, etc., over the duration of 10 years. She established the following symptoms:

- daytime tiredness
- loss of productiveness
- sleeplessness
- headaches
- cardiovascular regulation changes of various types
- neurovegetative disorders
- neurosis
- depressions
- hyperactivity and inner agitation

According to Prof. Gordon [1966], the symptoms strengthened with increasing duration of exposure, and sensitivity to the microwave radiations increased.

Reports from Poland were presented by Baranski (1971, 1967, 1966) and Czereski et al. (1972, 1964) about:

- microwave syndrome and
- chromosome damage, and by

Minecki [1967, 1965, 1964, 1963, 1961] about:

- psychoneurovegetative disorders
- neurasthenia
- chromosome damage
- embryonic development disorders

after the chronic influence of weak high-frequency fields.

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Already in November 1958, the "Security Measures for Persons in the Range of Microwave Generators" was instituted by order of the Minister of the Soviet Public Health Service.

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The threshold value was bindingly stipulated at 10.0 mW/cm^2 in the USA at the 1955 conference at the Mayo Clinic in Minnesota. With the establishment of NATO, this threshold value became binding also for Western Europe. This difference of three orders of magnitude between the threshold value in the East and the threshold value in the West still exists today. In the East, electrical smog is taken more seriously.

The annual report of the national Committee of Russia for non-ionizing radiation of the year 2002 addressed the following themes among others:

- "Emotional stress and EMFs" (electromagnetic fields),

- "Electromagnetic Fields and Cancer",
- "The State of Health and Work Conditions of Workers in Civil Aviation Who Operate Radar, Navigation, and Communication Equipment",
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Basically, it is recommended to keep mobile phone conversations as short as possible and in no case to have a conversation longer than 15 minutes.

5. Research into the Findings in the Russian-Language Scientific Literature Shocked German Authorities

Prof. Dr. Karl Hecht and his associate Hans-Ullrich Balzer were commissioned in 1996 by the German Federal Institute for Telecommunication to carry out research on the Russian technical literature about the health-damaging and biological effect of high-frequency electromagnetic radiations from the years 1960-1996. In 1997, the authors turned over the report, which was based on 878 scientific works, to the sponsor. The data was so overwhelming for the German conditions that the report immediately disappeared into the archive.

6. The Duration of the Effect of High-Frequency Electromagnetic Radiation – Decisive for Health Damage

Next we would like to mention a few important facts of this report.

The duration of the effects proved to be a very decisive factor for the health-damaging effect of the EMF. A three-phase progression in the development of the microwave syndrome was proved.

First: Initial Phase

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First Subphase = Pronounced sympathicotonia (hypertonía) activation phase. This phase is comparable with the alarm phase of the general adaptation syndrome of Selye and with the unspecific activation according to Lindsley [1951], Lacey [1967], and others.

Second Subphase: Performance-promoting, increased sympathicotonic reaction phase in the sense of a eustress reaction or an emotional activation [Lindsley 1951]. According to Selye [1953], it is to be interpreted as a resistance phase.

Third Subphase: Adaptive, balancing phase with less sympathicotonic deflection. The body functions are still located in the range of homeostasis, so normal values are measured, although latent, intermittently appearing ailments may already express themselves. This phase, too, is still to be assigned to the resistance phase, according to Selye [1953].

Second: Pre-Morbid or Early Phase of a Chronic Disease

After 3-5 years of influence duration, weakly visible and/or strengthening pathologic developments of neurasthenic basic symptoms with vagotonic reaction tendencies, sleep disorders, and daytime tiredness appear.

Third: Exhaustion Syndrome

Pronounced neurasthenic symptoms with increasing pathologic lapses of the regulation system, neurotic and neurasthenic symptoms, sleep disorders, daytime tiredness, and general exhaustion are dominating appearances. Effect duration > 5 years.

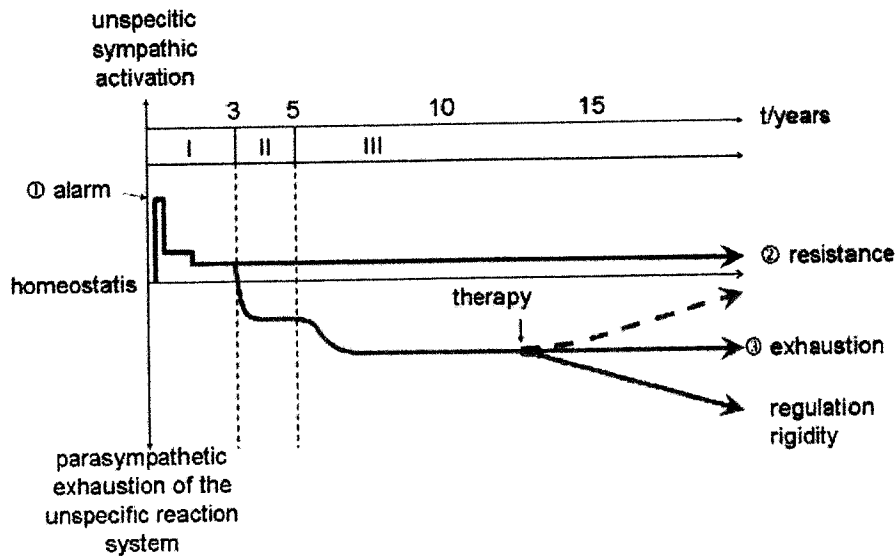


Figure 1. Schema of the stages of illness development after long-term influence of EMF radiation in comparison with the stages (①, ②, and ③) of the General Adaptation Syndrome according to Hans Selye [1953]. I = activation phase, A = activation (excitement), B = positive stimulation, C = adaptive phase; II = latent, weak pathologic development; III = strong pathologic development. Based on the findings of a literature review [Hecht und Balzer 1997].

7. Essential Findings after Long-Term EMF-(EF-)Effect

Objectively gathered findings:

- neurasthenia, neurotic symptoms
- EEG changes (decay of the alpha rhythm into the theta rhythm and isolated delta rhythm)
- sleep disorders
- deformation of the biologic rhythm hierarchy
- disorder in the hypothalamohypophyseal adrenal cortex system
- arterial hypotonia, more rarely arterial hypertonia, bradycardia, or tachycardia
- vagotonic displacement of the cardiovascular system
- hyperfunction of the thyroid
- potency disorders
- digestive function disorders
- slowing down of the sensory motor system
- resting tremor of the finger
- hair loss
- tinnitus
- increased susceptibility to infection

Subjective Complaints:

- exhaustion, lack of energy
- daytime tiredness
- quick tiring under stress
- constriction of physical and mental ability
- concentration and memory decline
- night sweats
- spontaneously occurring excitability from hypotonic reaction situation, especially in the case of external pressures
- cardiac pain, heart racing
- weakness of concentration
- headaches
- lightheadedness

[Rubzowa 1983; Rakitin 1977; Drogitschina et al. 1966; Gordon 1966; Drogitschina und Sadschikowa 1965, 1964; Piskunova und Abramowitsch-Poljakow 1961].

8. Factors That Can Influence the Development of an Illness through Athermal/Biologic, Non-Ionizing EMF Radiation

Duration of Influence: At the earliest, pathological appearances appear after ca. 3 years; duration of influence > 20 min. daily, 5x per week has no pathological consequences.

Age: Younger organisms show greater electromagnetic sensitivity than older ones; children especially must be protected.

Individual State of Health Electromagnetic Sensitivity: decreasing healthiness increasingly raises electromagnetic sensitivity

Status of the Elektrolyte/Mineral Balance: lack of minerals and toxic stress increases electromagnetic sensitivity

Additional stressor effects, e.g. noise, other radiations, conflicts, and stress, increase the risk to come down with microwave syndrome.

Active Ingredients and Medications: stimulants, e.g. caffeine, can increase electromagnetic sensitivity.

9. What Good Are Short-Term Research Projects?

The research projects of today's cell phone, microwave, and telecommunication industry run for at most one year, very rarely two years. According to the state of knowledge shown, no harmful effect of the high-frequency electromagnetic radiation can be established at all. How the factor of the duration of influence is handled in these research projects should be explained with an example of a BUWAL study (BUWAL = Switzerland's Department of the Environment).

The findings of a table of scientific works regarding the investigation of the duration of effect of high-frequency microwave radiations on various function systems or states of health, which one of us extracted and compiled from the tables of the BUWAL document, shows that among 129 analyzed scientific works or studies, an immediate effect (up to 1 h) was investigated in 44% of them. The duration of effect was tested for the short-term (up to three days) in 22.5% of them and for the middle-term (3-30 days) in 11% of them. Only 22.5% investigated the duration of effect of high-frequency microwaves longer than a month.

It must be added that cardiovascular, hormone system, and immune system symptoms of radio-wave or microwave sickness are cited in the BUWAL documentation in the form of headaches, sleep disorders, general condition, EEG changes, and information processing, which the authors could not explain with their one-sided conceptions of the thermal effects of high-frequency electromagnetic radiation.

With such erroneous research approaches, of course no health-damaging effect can be found. Such research projects are also completely unnecessary, because the athermal, health-damaging effect of high-frequency electromagnetic radiation has been known for 75 years and has been confirmed again and again during this time in more than a thousand investigations, whenever serious principles of research were guaranteed.

10. The Following Definitions Are Cited For Better Understanding of the Effect of High-Frequency Electromagnetic Radiation on People and Corresponding Interpretations

10.1 Health Definitions

Various views have existed about the term “health” for 60 years.

Conventional medicine defines health as the exemption from organic, verifiable sicknesses.

Such a definition does not correspond to the realities. The so-called “functional syndrome” or somatoform disorders (ICD 10F) are not accounted for in it.

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Health is to be understood “as a satisfactory measure of functional capability in physical, mental, social, and economic regards and the ability to take care of oneself until an old age” [WHO 1987].

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The terms health damage, bioactive effect, or bioactive reaction are frequently used without being sharply delimited from one another, thus leading to confusion. Therefore, a short definition for clarification:

A bioactive effect is mostly an unspecific reaction of the organism to outside influences of various natures (physical, chemical, social, bacterial, viral). It must be differentiated:

- if this reaction is temporary and the homeostasis (norm) recuperates through a reversible transient effect; that is an individual’s normal adaptation reaction, or
- if the changed reaction remained temporarily (e.g. several days) and then “normalized” again through a reversible transient effect. That would be equivalent to a health disorder in which the foreign influence was effective as a trigger, or
- if the triggered changed reaction involves problems, losses of abilities to do things, and quality of life for the long-term and is not reversible. That is damage to one’s health.

Under health damage, we thus understand enduring or intermittent irreversible changes of the physical, mental, and social functional capability of the person, which can arise from noxious influence developed over the short-term or long-term, or also from intense, short-term influences (e.g. shock). (Noxa = pollutants, harmful agents, pathogenic causes)

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Animals and plants are also very negatively influenced by this high-frequency electromagnetic radiation. In the case of cows, reduction of the milk yield and malformed offspring have been proven. Graver for humankind could be the death of bees observed everywhere due to the electro-smog contaminated environment. When the bees are dead, people not only have no more honey, but also no more fruit, because pollination of the flowers is impossible without bees. Humankind stands today before an important decision: further development of the technogenic pollution of the environment or finding our way back to Nature.

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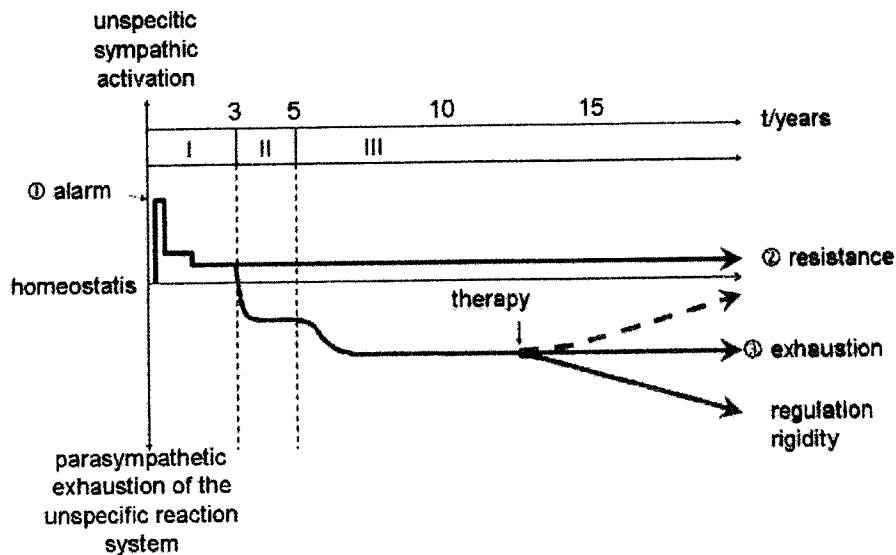


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American Academy of Environmental Medicine

Electromagnetic and Radiofrequency Fields Effect on Human Health

For over 50 years, the American Academy of Environmental Medicine (AAEM) has been studying and treating the effects of the environment on human health. In the last 20 years, our physicians began seeing patients who reported that electric power lines, televisions and other electrical devices caused a wide variety of symptoms. By the mid 1990's, it became clear that patients were adversely affected by electromagnetic fields and becoming more electrically sensitive. In the last five years with the advent of wireless devices, there has been a massive increase in radiofrequency (RF) exposure from wireless devices as well as reports of hypersensitivity and diseases related to electromagnetic field and RF exposure. Multiple studies correlate RF exposure with diseases such as cancer, neurological disease, reproductive disorders, immune dysfunction, and electromagnetic hypersensitivity.

The electromagnetic wave spectrum is divided into ionizing radiation such as ultraviolet and X-rays and non-ionizing radiation such as radiofrequency (RF), which includes WiFi, cell phones, and Smart Meter wireless communication. It has long been recognized that ionizing radiation can have a negative impact on health. However, the effects of non-ionizing radiation on human health recently have been seen. Discussions and research of non-ionizing radiation effects centers around thermal and non-thermal effects. According to the FCC and other regulatory agencies, only thermal effects are relevant regarding health implications and consequently, exposure limits are based on thermal effects only.¹

While it was practical to regulate thermal bioeffects, it was also stated that non-thermal effects are not well understood and no conclusive scientific evidence points to non-thermal based negative health effects.¹ Further arguments are made with respect to RF exposure from WiFi, cell towers and smart meters that due to distance, exposure to these wavelengths are negligible.² However, many *in vitro*, *in vivo* and epidemiological studies demonstrate that significant harmful biological effects occur from non-thermal RF exposure and satisfy Hill's criteria of causality.³ Genetic damage, reproductive defects, cancer, neurological degeneration and nervous system dysfunction, immune system

dysfunction, cognitive effects, protein and peptide damage, kidney damage, and developmental effects have all been reported in the peer-reviewed scientific literature.

Genotoxic effects from RF exposure, including studies of non-thermal levels of exposure, consistently and specifically show chromosomal instability, altered gene expression, gene mutations, DNA fragmentation and DNA structural breaks.⁴⁻¹¹ A statistically significant dose response effect was demonstrated by Mashevich *et al.*, who reported a linear increase in aneuploidy as a function of the Specific Absorption Rate(SAR) of RF exposure.¹¹ Genotoxic effects are documented to occur in neurons, blood lymphocytes, sperm, red blood cells, epithelial cells, hematopoietic tissue, lung cells and bone marrow. Adverse developmental effects due to non-thermal RF exposure have been shown with decreased litter size in mice from RF exposure well below safety standards.¹² The World Health Organization has classified RF emissions as a group 2 B carcinogen.¹³ Cellular telephone use in rural areas was also shown to be associated with an increased risk for malignant brain tumors.¹⁴

The fact that RF exposure causes neurological damage has been documented repeatedly. Increased blood-brain barrier permeability and oxidative damage, which are associated with brain cancer and neurodegenerative diseases, have been found.^{4,7,15-17} Nittby *et al.* demonstrated a statistically significant dose-response effect between non-thermal RF exposure and occurrence of albumin leak across the blood-brain barrier.¹⁵ Changes associated with degenerative neurological diseases such as Alzheimer's, Parkinson's and Amyotrophic Lateral Sclerosis (ALS) have been reported.^{4,10} Other neurological and cognitive disorders such as headaches, dizziness, tremors, decreased memory and attention, autonomic nervous system dysfunction, decreased reaction times, sleep disturbances and visual disruption have been reported to be statistically significant in multiple epidemiological studies with RF exposure occurring non-locally.¹⁸⁻²¹

Nephrotoxic effects from RF exposure also have been reported. A dose response effect was observed by Ingole and Ghosh in which RF exposure resulted in mild to extensive degenerative changes in chick embryo kidneys based on duration of RF exposure.²⁴ RF emissions have also been shown to cause isomeric changes in amino acids that can result in nephrotoxicity as well as hepatotoxicity.²⁵

Electromagnetic field (EMF) hypersensitivity has been documented in controlled and double blind studies with exposure to various EMF frequencies. Rea *et al.* demonstrated that under double blind placebo controlled conditions, 100% of subjects showed reproducible reactions to that frequency

to which they were most sensitive.²² Pulsed electromagnetic frequencies were shown to consistently provoke neurological symptoms in a blinded subject while exposure to continuous frequencies did not.²³

Although these studies clearly show causality and disprove the claim that health effects from RF exposure are uncertain, there is another mechanism that proves electromagnetic frequencies, including radiofrequencies, can negatively impact human health. Government agencies and industry set safety standards based on the narrow scope of Newtonian or “classical” physics reasoning that the effects of atoms and molecules are confined in space and time. This model supports the theory that a mechanical force acts on a physical object and thus, long-range exposure to EMF and RF cannot have an impact on health if no significant heating occurs. However, this is an incomplete model. A quantum physics model is necessary to fully understand and appreciate how and why EMF and RF fields are harmful to humans.^{26,27} In quantum physics and quantum field theory, matter can behave as a particle or as a wave with wave-like properties. Matter and electromagnetic fields encompass quantum fields that fluctuate in space and time. These interactions can have long-range effects which cannot be shielded, are non-linear and by their quantum nature have uncertainty. Living systems, including the human body, interact with the magnetic vector potential component of an electromagnetic field such as the field near a toroidal coil.^{26,28,29} The magnetic vector potential is the coupling pathway between biological systems and electromagnetic fields.^{26,27} Once a patient’s specific threshold of intensity has been exceeded, it is the frequency which triggers the patient’s reactions.

Long range EMF or RF forces can act over large distances setting a biological system oscillating in phase with the frequency of the electromagnetic field so it adapts with consequences to other body systems. This also may produce an electromagnetic frequency imprint into the living system that can be long lasting.^{26,27,30} Research using objective instrumentation has shown that even passive resonant circuits can imprint a frequency into water and biological systems.³¹ These quantum electrodynamic effects do exist and may explain the adverse health effects seen with EMF and RF exposure. These EMF and RF quantum field effects have not been adequately studied and are not fully understood regarding human health.

Because of the well documented studies showing adverse effects on health and the not fully understood quantum field effect, AAEM calls for exercising precaution with regard to EMF, RF and general frequency exposure. In an era when all society relies on the benefits of electronics, we must find ideas and technologies that do not disturb bodily function. It is clear that the human body uses electricity from the chemical bond to the nerve impulse and obviously this orderly sequence can be

disturbed by an individual-specific electromagnetic frequency environment. Neighbors and whole communities are already exercising precaution, demanding abstention from wireless in their homes and businesses.

Furthermore, the AAEM asks for:

- An immediate caution on Smart Meter installation due to potentially harmful RF exposure.
- Accommodation for health considerations regarding EMF and RF exposure, including exposure to wireless Smart Meter technology.
- Independent studies to further understand the health effects from EMF and RF exposure.
- Recognition that electromagnetic hypersensitivity is a growing problem worldwide.
- Understanding and control of this electrical environmental bombardment for the protection of society.
- Consideration and independent research regarding the quantum effects of EMF and RF on human health.
- Use of safer technology, including for Smart Meters, such as hard-wiring, fiber optics or other non-harmful methods of data transmission.

Submitted by: Amy L. Dean, DO, William J. Rea, MD, Cyril W. Smith, PhD, Alvis L. Barrier, MD ·

Bibliography: Electromagnetic and Radiofrequency Fields Effect on Human Health

1. California Council on Science and Technology. (Internet). (2011). Health Impacts of Radiofrequency Exposure from Smart Meters. Available from:
<http://www.ccst.us/publications/2011/2011smartA.pdf>
2. Electric Power Research Institute. (Internet). (2011). Radio-Frequency Exposure Levels from Smart Meters: A Case Study of One Model. Available from:
https://www.nvenergy.com/NVEnergize/documents/EPRI_1022270_caseStudy.pdf
3. Hill, AB. The Environment and Disease: Association or Causation? Proceedings of the Royal Society of Medicine. 1965; 58: 295-300.
4. Xu S, Zhou Z, Zhang L, et al. Exposure to 1800 MHz radiofrequency radiation induces oxidative damage to mitochondrial DNA in primary cultured neurons. Brain Research. 2010; 1311: 189-196.
5. Phillips JL, Singh NP, Lai H. Electromagnetic fields and DNA damage. Pathophysiology. 2009; 16: 79-88.
6. Ruediger HW. Genotoxic effects of radiofrequency electromagnetic fields. Pathophysiology. 2009; 16(2): 89-102.
7. Zhao T, Zou S, Knapp P. Exposure to cell phone radiation up-regulates apoptosis genes in primary cultures of neurons and astrocytes. Neurosci Lett. 2007; 412(1): 34-38.
8. Lee S, Johnson D, Dunbar K. 2.45 GHz radiofrequency fields alter gene expression on cultured human cells. FEBS Letters. 2005; 579: 4829-4836.
9. Demisia G, Vlastos D, Matthopoulos DP. Effect of 910-MHz electromagnetic field on rat bone marrow. The Scientific World Journal. 2004; 4(S2): 48-54.
10. Lai H, Singh NP. Magnetic-field-induced DNA strand breaks in brain cells of the rat. Environmental Health Perspectives. 2004; 112(6): 687-694. Available from:
<http://ehp03.niehs.nih.gov/article/info:doi/10.1289/ehp.6355>
11. Mashevich M, Foldman D, Kesar, et al. Exposure of human peripheral blood lymphocytes to electromagnetic fields associated with cellular phones leads to chromosomal instability. Bioelectromagnetics. 2003; 24: 82-90.
12. Magras IN, Xenos TD. RF radiation-induced changes in the prenatal development of mice. Bioelectromagnetics. 1997; 18:455-461.
13. Ban R, Grosse Y, Lauby-Secretan B, et al. Carcinogenicity of radiofrequency electromagnetic fields. The Lancet Oncology. 2011; 12(7): 624-626. Available from:

[http://www.thelancet.com/journals/lanonc/article/PIIS1470-2045\(11\)70147-4/fulltext?_eventId=login](http://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(11)70147-4/fulltext?_eventId=login)

14. Hardell L, Carlberg M, Hansson Mild K. Use of cellular telephones and brain tumour risk in urban and rural areas. *Occup. Environ. Med.* 2005; 62: 390-394.
15. Nittby H, Brun A, Eberhardt J, et al. Increased blood-brain barrier permeability in mammalian brain 7 days after exposure to the radiation from a GSM-900 mobile phone. *Pathophysiology.* 2009; 16: 103-112.
16. Awad SM, Hassan NS. Health Risks of electromagnetic radiation from mobile phone on brain of rats. *J. Appl. Sci. Res.* 2008; 4(12): 1994-2000.
17. Leszczynski D, Joenvaara S. Non-thermal activation of the hsp27/p38MAPK stress pathway by mobile phone radiation in human endothelial cells: Molecular mechanism for cancer - and blood-brain barrier – related effects. *Differentiation.* 2002; 70: 120-129.
18. Santini R, Santini P, Danze JM, et al. Study of the health of people living in the vicinity of mobile phone base stations: 1. Influences of distance and sex. *Pathol Biol.* 2002; 50: 369-373.
19. Abdel-Rassoul G, Abou El-Fateh O, Abou Salem M, et al. Neurobehavioral effects among inhabitants around mobile phone base stations. *Neurotox.* 2007; 28(2): 434-440.
20. Hutter HP, Moshammer H, Wallner P, Kundi M. Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations. *Occup. Environ. Med.* 2006; 63: 307-313.
21. Kolodynski AA, Kolodynska VV. Motor and psychological functions of school children living in the area of the Skrunda Radio Location Station in Latvia. *Sci. Total Environ.* 1996; 180: 87-93.
22. Rea WJ, Pan Y, Fenyves EJ, et al. Electromagnetic field sensitivity. *Journal of Bioelectricity.* 1991; 10(1 & 2): 243-256.
23. McCarty DE, Carrubba S, Chesson AL, et al. Electromagnetic hypersensitivity: Evidence for a novel neurological syndrome. *Int. J. Neurosci.* 2011; 121(12): 670-676.
24. Ingole IV, Ghosh SK. Cell phone radiation and developing tissues in chick embryo – a light microscopic study of kidneys. *J. Anat. Soc. India.* 2006; 55(2): 19-23.
25. Lubec G, Wolf C, Bartosch B. Amino acid isomerisation and microwave exposure. *Lancet.* 1989; 334: 1392-1393.
26. Smith CW. Quanta and coherence effects in water and living systems. *Journal of Alternative and Complimentary Medicine.* 2004; 10(1): 69-78.

27. Smith CW (2008) Fröhlich's Interpretation of Biology through Theoretical Physics. In: Hyland GJ and Rowlands P (Eds.) Herbert Fröhlich FRS: A physicist ahead of his time. Liverpool: University of Liverpool, 2nd edition, pp 107-154.
28. Del Giudice E, Doglia S, Milani M, et al. Magnetic flux quantization and Josephson behavior in living systems. *Physica Scripta*. 1989; 40: 786-791.
29. Tonomura A, Osakabe N, Matsuda T, et al. Evidence for Aharonov-Bohm effect with magnetic field completely shielded from electron wave. *Phys. Rev. Lett.* 1986; 56(8):792-75.
30. Del Giudice E, De Ninno A, Fleischmann, et al. Coherent quantum electrodynamics in living matter. *Electromagn. Biol. Med.* 2005; 24: 199-210.
31. Cardella C, de Magistris L, Florio E, Smith C. Permanent changes in the physic-chemical properties of water following exposure to resonant circuits. *Journal of Scientific Exploration*. 2001; 15(4): 501-518.

Mr Gibb. Minister for Schools.

Date: 13/10/2011

Wi-Fi Risk in Schools

Minister,

Following our discussion last Friday, please find enclosed the letter requested.

By 1976, thousands of Government research documents existed highlighting the health dangers of below-thermal (Wi-Fi) microwave irradiation. In this year, the U.S Government advised Western Governments to... 'not enforce stringent exposure standards as this would become unfavourable for industrial output.'

This directive exists today. The U.S Government listed both physiological and neuropathological illnesses from low-level microwave irradiation.

Concerning the above radiation:

Children are more vulnerable than adults due to immature immune systems, soft bones, the blood-brain-barrier being under-developed, damage to ovarian follicles and their size (they absorb more radiation).

Research has shown over 200 clusters of Staff and Childhood illnesses in schools, attributed to low-level microwave irradiation. I know of three countries removing Wi-Fi from schools purely on health grounds.

These phenomena have been raised by MP's in the House of Commons, arguing over cancer clusters of children exposed to such radiation. One such case concerned eleven children under the age of eleven- another contained twelve children.

Following each such debate a Minister stands and says "...HPA adheres strictly to the I.C.N.I.R.P Guidelines ..." - or similar words. These statements are in fact untrue. The I.C.N.I.R.P statement actually says: 'Children may have a lower tolerance ... than the rest of the population ... decision-makers should review current scientific literature ... determine appropriate reduction factors.'

This became the focus of the international Bio-Initiative Report which set new safety levels as recommended by the Council of Europe.

A classroom of Wi-Fi laptops exceeds, by many orders of magnitude, this E.U safety level. The classrooms' radiation level even exceeded that from a W.H.O adviser, who found that 47.7% of pregnant women miscarried before the 8th week of pregnancy, with levels much lower than those in any classroom. This phenomenon has now been confirmed experimentally with other mammalian species, and published.

Exacerbating this is the 'knock on effect' of ovarian damage to young girls. This problem is two-fold:

Firstly, the ovarian follicles can suffer D.N.A damage (mitochondrial DNA is 10 x's more susceptible to low-level chronic microwave irradiation than other DNA) leading to genetically damaged offspring.

N.B. Mitochondrial DNA is irreparable, thence will succeed through successive generations.

Secondly, should a pregnant student or teacher suffer this irradiation, the embryo/foetus has little or no defence mechanisms for the first ~100 days of pregnancy. At this time, the lady may not know she is pregnant and hence take little or no precautions, for the protection of her embryo. There is no known safe level for an embryo/foetus or child.

Often, an overlooked point is that the absorption of this radiation is accumulative and a low dose can be as harmful, over a long period, as a short high dose. The industry's own research shows this-hence their warnings to children/pregnant women.

Finally, on a global scale, research publications now show the Communications Industry to be the most polluting on the Planet, re carbon footprint - exceeding that of the Aviation Industry.

Introducing Wi-Fi into every school can only compound this problem. Also my personal discussions with Royalty, Ministers, Governments and Leaders of Communities, show that they worry about a possible ~ 40% increase in their health budget in anticipation of the (minimum) ~ 3% + to (maximum) ~ 47.7% of sick populations - some of this from the modulations/pulses entraining the brain waves, causing mental illness and severe physical conditions.

Signed,

Barrie Trower ,
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Letter from Dr. De-Kun Li, MD, PhD, MPH

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Dear Ms. Martin:

Thank you for inviting me to provide my professional opinions on the SmartMeter safety issue. I will address two questions raised in the attached letter. But first, here is some background information:

1. Currently there are no national or international “**standards**” for safety levels of radiofrequency (a range of 3 kHz to 300 GHz) devices. What FCC is currently using are “guidelines” which have much lower certainty than a “standard”. One can go to many governmental agencies’ websites like NIOSH, EPA, FDA, etc. to verify this. Therefore, for anyone to claim that they meet “FCC” standards gives a false impression of safety certainty compared to “guidelines” which implies that a lot is “unknown.”

2. The current FCC “guideline” was adopted by FCC based on EPA’s recommendation in 1996. EPA made the recommendation “with certain reservation”. There was a letter by Norbert Hankin, Center for Science and Risk Assessment, Radiation Protection Division at EPA describing the current FCC guidelines (The letter can be found through a Google search). According to Hankin’s letter, the FCC current guidelines were solely based on “thermal effect” of radiofrequency, a level at which radiofrequency can cause heat injury. As we know, heat injury is not what the public is concerned about regarding radiofrequency safety. Their concerns are about cancer, miscarriages, birth defects, low semen quality, autoimmune disease, etc. Hankin’s letter, specifically emphasized that the EPA recommended guidelines that FCC is currently using do not apply to non-thermal effects or mechanisms (e.g., cancer, birth defects, miscarriage, autoimmune diseases, etc) which are the focus of the public’s concern. Hankin’s letter states **“Therefore, the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified.”**

3. In addition to being limited to only the thermal effect, the letter also states that the current FCC guidelines recommended by EPA were only based on experiments on animals in laboratories. Establishing firm safety standards

usually requires evidence from human studies such as epidemiological studies. The current FCC guidelines were based on animal studies only, not human data, which may explain why they are only considered as guidelines rather than standards. Furthermore, the thermal effect, used to establish the FCC guidelines, was based on *acute* thermal effect. It did not even deal with chronic long-term intermittent effect. In fact, Hankin's letter also states **"exposures that comply with the FCC's guidelines generally have been presented as "safe" by many of the RF system operators and service providers who must comply with them, even though there is uncertainty about possible risk from nonthermal, intermittent exposures that may continue for years"**

4. Electromagnetic fields (EMFs) can come from sources with a spectrum of frequencies. EMFs from electric power sources usually have a frequency less than 1 kHz, while radiofrequency (RF) generated by SmartMeters are reportedly in the range 900 MHz to 2.4 GHz. While overall research on the EMF health effect remains limited, there are more reported studies examining the EMF health effect in power line frequencies (< 1 kHz) including some of my research¹⁻³ than in RF. It is not clear at this moment whether the findings on the EMF health effect at lower frequencies (i.e., < 1 kHz) can be applied to RF range. If the underlying mechanisms are similar, the findings in lower frequency EMFs can then be applied to RF range for SmartMeter. Many studies of power frequencies reported associations with childhood leukemia, miscarriage, poor semen quality, autoimmune diseases at a level much lower than those generating thermal damage as used by FCC.

5. Many chronic diseases that the public is concerned about (e.g., cancer) have a long latency period and take decades to show symptoms. Most wireless network and devices have only been used widely in the last 10 to 15 years. Therefore, many studies evaluating RF health effect related to cancer risk previously, if they failed to identify an adverse health effect, are not appropriate to be used as evidence to claim the safety of RF exposure since the latency period has not been long enough to show the effect even if an adverse association does indeed exist.

6. While 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. 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 EMF signals, likely in a very low level. External EMFs could conceivably interfere with normal cell communication, thus disrupting normal cell differentiation and proliferation. Such disturbance could lead to miscarriage, birth defects, and cancer.

To address the two questions raised in the letter:

1. Whether FCC standards for SmartMeter are sufficiently protective of public health taking into account current exposure levels to radiofrequency and electromagnetic fields. First, FCC currently has only "guidelines", not standards as explained above. Second, as described in the background information above, the current FCC guidelines only deal with thermal effect, which was also based on animal studies only. Meeting the current FCC guidelines, in the best-case scenario, only means that one won't have heat damage from SmartMeter exposure. It says nothing about safety from the risk of many chronic diseases that the public is most concerned about such as cancer, miscarriage, birth defects, semen quality, autoimmune diseases, etc. Therefore, when it comes to non-thermal effects of RF, which is the most relevant effect for public concerns, FCC guidelines are irrelevant and can not be used for any claims of SmartMeter safety unless we are addressing heat damage.

2. Whether additional technology-specific standards are needed for SmartMeter and other devices that are commonly found in and around homes, to ensure adequate protection from adverse health effects. Safety standards for RF exposure related to non-thermal effects are urgently needed to protect the public from potential adverse health effects from RF exposure that are increasingly prevalent in our daily life due to installation of ever-powerful wireless networks and devices like SmartMeter. Unfortunately scientific research is still lacking in this area and some endpoints like cancer take decades to study. The safety standards are not likely to be available anytime soon. The bottom line is that the safety level for RF exposure related to non-thermal effect is unknown at present and whoever claims that their device is safe regarding non-thermal effect is either ignorant or misleading.

In summary, we do not currently have scientific data to determine where the safe RF exposure level is regarding the non-thermal effect. Therefore, it

should be recognized that we are dealing with uncertainty now and most likely for the foreseeable future. The question for governmental agencies, especially those concerned with public health and safety, is that given the uncertainty, should we err on the side of safety and take the precautionary avoidance measures? Unknown does not mean safe. There are two unique features regarding SmartMeter exposure. First, because of mandatory installation, it is a universal exposure. Virtually every household is exposed. Second, it is an involuntary exposure. The public that are exposed to SmartMeters do not have any input in deciding whether they would like to have the SmartMeter installed. The installation is imposed upon the public. Governmental agencies for protecting public health and safety should be much more vigilant towards involuntary environmental exposures because governmental agencies are the only defense against such involuntary exposure. Given the uncertainty of the SmartMeter safety, one rational first step of public policy could be to require household consent before installation of SmartMeters. Finally, because of the nature of universal exposure, many susceptible and vulnerable populations including pregnant women and young children are unknowingly exposed 24 hours a day, 7 days a week. Usually, the threshold of harmful level is much lower for susceptible populations.

References

1. Li DK, Odouli R, Wi S et al. A population-based prospective cohort study of personal exposure to magnetic fields during pregnancy and the risk of miscarriage. *Epidemiology* 2002;13(1):9-20.
2. Li DK, Yan B, Li Z et al. Exposure to magnetic fields and the risk of poor sperm quality. *Reprod Toxicol* 2010;29(1):86-92.
3. Li DK, Checkoway H, Mueller BA. Electric blanket use during pregnancy in relation to the risk of congenital urinary tract anomalies among women with a history of subfertility. *Epidemiol* 1995;6:485-489.

De-Kun Li, MD, PhD, MPH, is a senior research scientist at the Division of Research, Kaiser Permanente Northern California.

Dr. Li completed his medical training and master's degree in public health at Shanghai Medical University, Shanghai, China. He then received his PhD in

epidemiology from the University of Washington, Seattle. Dr. Li has conducted research in the areas of pregnancy outcomes, sudden infant death syndrome, women's health, breast cancer, pharmacological effects on pregnancy outcomes, genetic etiology, and occupational exposures since 1984. His research interests include: reproductive, perinatal, and pediatric epidemiology, such as etiology of miscarriage, sudden infant death syndrome, preterm delivery, preelcampsia, low birth, infertility, cerebral palsy, birth defects, pediatric diseases (including childhood cancer and neurological disorders), autoimmune diseases in relation to maternal-fetal interaction, breast cancer, and risk factors for low semen quality. Dr. Li' research areas also include pharmacoepidemiological effect of medication use during pregnancy, genetic determinants of adverse pregnancy outcomes, the effect of electromagnetic fields on adverse pregnancy outcomes and low sperm quality, and the effect of endocrine disruptors, specifically Bisphenol A (BPA), on male and female reproductive systems. He is currently the associate editor of the American Journal of Epidemiology. Dr. Li has participated in a National Institute of Child Health and Human Development (NICHD) sponsored panel evaluation of "Back to Sleep" campaign and Sudden Infant Death Syndrome risk. He has also served as a member on the Ad Hoc Committee reviewing the NICHD program project, and on several Special Emphasis Panels at National Institute of Occupational Safety and Health and National Institute of Environmental Health and Sciences reviewing grant proposals. He has served as a member of the Policy Committee at the American College of Epidemiology. He was invited by the National Academy of Science to participate as a panel member in the U.S.-China Roundtable on Collaboration of Biomedical Research. In addition, he teaches at Stanford University and supervises doctoral students from the departments of epidemiology at UCB (University of California, Berkeley) and UCLA (University of California, Los Angeles).

Dr. Li has published extensively with 29 first-authored publications. He has obtained, as the principal investigator, numerous grants, ranging from \$600,000 to \$ 3.49 million from various federal agencies of the National Institutes of Health, as well as the California Public Health Foundation. Many of his publications have been widely reported by the national, international, and local news media including recent studies of caffeine intake and miscarriage, pacifier use and use of a fan in relation to SIDS risk, and depression during pregnancy and preterm delivery. Other examples of work receiving wide media coverage include the risk of miscarriage associated with EMF exposure, NSAID use and the risk of miscarriage, hot tub use during pregnancy and the risk of miscarriage, and maternal-fetal HLA compatibility and the risk of preterm delivery.

Current Position(s):

Research Scientist III, Division of Research, Kaiser Permanente Northern California

Lecturer, Stanford University, Department of Health Research and Policy

Primary Research Interests:

Reproductive, prenatal, and pediatric epidemiology, such as etiology of 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.

Health effects of electromagnetic fields

Pharmacological effects of medication use during pregnancy on pregnancy outcome

Genetic determinants of pregnancy outcome

Risk factors for poor semen quality

Health effect of endocrine disruptors, especially Bisphenol A (BPA), on male and female reproductive systems

Electromagnetic Radiation (EMR) Clashes with Honey Bees

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ABSTRACT

Apiculture has developed in to an important industry in India as honey and bee-wax have become common products. Recently a sharp decline in population of honey bees has been observed in Kerala. Although the bees are susceptible to diseases and attacked by natural enemies like wasps, ants and wax moth, constant vigilance on the part of the bee keepers can over come these adverse conditions. The present plunge in population (< 0.01) was not due to these reasons. It was caused by man due to unscientific proliferation of towers and mobile phones.

Key words: Electromagnetic radiation, Apiculture, Colony collapse disorder.

1. Introduction

Bees and other insects have survived and evolved complex immune system on this planet over a span of millions of years. It is not logical that they would now suddenly die out now due to diseases and natural parasites. This suggests another factor has been introduced to their environment that disrupts their immune system. This man made factor is the mobile towers and mobile phones.

The public is not being informed of the threat due to deliberate attempts on the part of mobile phone makers to mask the direct causal relationship. Over the past several months a cadre of scientists, funded by the deep pockets of the mobile phone industry, has suggested viruses, bacteria, and pesticides are to blame for the unprecedented honey bee decline. Rather than critically assessing the problem, the industry is dealing with it as a politics and public relation problems thus manipulating perception of the appropriate remedy. Sadly, this deceptive practice is business as usual for the mobile phone industry. If the reason behind the population decrease were biological or chemical there would be a pattern of epidemic spread. Observers would be able to trace the spread of bee disappearance from a source similar to the spread of SARS a few years ago. This pattern did not occur, however mobile towers and mobile phones meet the criterion.

New experiments suggests a strong correlation between population decline and cellular equipment. . The massive amount of radiation produced by towers and mobile phones is actually frying the navigational skills of the honey bees and preventing them from returning back to their hives. The thriving hives suddenly left with only queens, eggs and hive bound immature worker bees. Thus electromagnetic radiation exposure provides a better explanation for Colony Collapse Disorder (CCD) than other theories. The path of CCD in India has followed the rapid development of cell phone towers, which cause atmospheric electromagnetic radiation.

Insects and other small animals would naturally be the first to obviously be affected by this increase in ambient radiation since naturally they have smaller bodies and hence less flesh to be penetrated by exposure to microwaves. The behavioral pattern of bees alters when they are in close proximity to mobile phones and towers. The vanished bees are never found, but thought to die singly far from home. Bee keepers told that several hives have been abruptly abandoned. If towers and mobile phones increase the honey bees might be wiped out in ten years. Radiation of 900 MHz is highly bioactive, causing significant alternation in the physiological function of living organisms ⁷.

2. Materials and Methods

Six colonies of honeybees (*Apis mellifera*) were selected. Three colonies were selected as test colonies (T₁, T₂ & T₃) and the rest were as control (C₁, C₂ & C₃). The test colonies were provided with mobile phones in working conditions with frequency of 900 MHz for 10 minutes for a short period of ten days. EMF (Electromotive field) power density was measured with the help of RF Power density meter. The control colonies had not provided with mobile phones. Queen prolificacy was calculated in terms of egg laying rate of the queen ¹. Flight activity and returning ability were measured as number of worker bees leaving and returning respectively to the hives per minute: before exposure, during exposure and after exposure.

3. Results

The results of the studies are presented in Table. The present study showed that after ten days the worker bees never returned hives in the test colonies. The massive amount of radiation produced by mobile phones and towers is actually frying the navigational skills of the honey bees and preventing them from returning back to their hives ¹⁻⁴. It was shown that the total bee strength was significantly higher in the control colonies being nine comb frames as compared to one in the test colony at the end of the experiment. The thriving hives suddenly left with only queens, eggs and hive bound immature worker bees. The queens in the test colonies produced fewer eggs/day (100) compared to the control (350). It has previously been reported that there is low egg laying rate in queens exposed to high voltage transmission lines ⁵ or exposure of the queen bees to cell phone radiation stimulated her to produce only drones ⁶. Thus electromagnetic radiation (EMR) exposure provides a better explanation for Colony Collapse Disorder (CCD) than other theories. The path of CCD in India has followed the rapid development of cell phone towers and cell phones, which cause atmospheric electromagnetic radiation.

4. Discussion

Some countries have sought to limit the proliferation of mobile towers with strict rules. But in India no such rules have been formulated or implemented. Given the proliferation of mobile phone towers and their vital role in communications, solutions to the problem will not be as simple as eliminating the towers. One possibility is shielding the bee hives with EMR resistant materials.

Another solution would be granting local communities the ability to control whether or not to install mobile towers. On one hand, community members would be able to exert some control over their environment and determine whether the benefits outweigh the costs and risks. On the other, it is highly susceptible to manipulation by powerful influences, especially since the

bee keepers have significantly less influence, power and wealth than the mobile phone companies.

However, Indians could risk losing even this right to self determination if the cellular providers can impose a country wide mandate prohibiting regulation against them, similar to the Telecommunications Act of 1996 in the United States. The Act prohibited local governments from making sitting decisions based on the perceived health impacts of wireless facilities. Indian advocates are concerned that such regulations might be upheld in India as they were in the United States in order to “eliminate service gapes in its cellular telephone service area.” In Kerala there are about 600,000 beehives and over 100,000 workers are engaged in Apiculture. A single hive may yield 4-5 kg of honey. Moreover, the destruction of bee hives could be a major environmental disaster. Honeybees are responsible for pollinating over 100 commonly eaten fruit and vegetable crops and without bees the food system would be in serious trouble. Rural village dependent on locally grown foods would be most vulnerable. The need of the hour is to check unscientific proliferations of mobile phone towers. More research is essential on how to protect the bee hives from the electromagnetic exposure, but perhaps more to study the impacts on humans.

Table 1: Change in colony status of honeybees exposed to mobile phones

| Parameter | Control (mean ± SD) | Treated (10 m exposure for 10 days. |
|---|----------------------|--------------------------------------|
| (No. of worker bees leaving the hive entrance/ minute) | | |
| Before exposure | 40.7±15 | 38.2±12 |
| During exposure | 41.5±14 | 18.5±13 |
| After exposure | 42.4±14 | Nil |
| Returning ability | | |
| Before exposure | 42.5±15 | 39.5±14 |
| During exposure | 43.6±14 | 15.6±13 |
| After exposure | 44.6±13 | Nil |
| Bee strength | | |
| Before exposure | 9 Frame | 9 Frame |
| During exposure | 9 Frame | 5 Frame |
| After exposure | 9 Frame | I Frame |
| Egg laying rate of queen /day | | |
| Before exposure | 365.25 | 355.10 |
| During exposure | 362.15 | 198.60 |
| After exposure | 350.15 | 100.00 |

All mobile phone towers emit microwave radiations, which is in the radio frequency radiation (RFR), part of the spectrum of electromagnetic waves. Though RFR, like Ultra -violet (UV) and Infra-red light, is a source of non-ionizing radiation, these radiations, together with ionizing electromagnetic radiations such as X- rays, gamma rays make up the electromagnetic spectrum. Radio frequency of the electromagnetic waves ranged from 100 kilo hertz (KHz) to 300 Giga hertz (GHz). Radio frequency radiation is a source of thermal energy and in adequate doses, has all the known effects of heating on biological systems⁷.

Despite a growing number of warnings from scientists, like me, the Government has done nothing to protect people and the environment. Steps must be taken to control the installations of mobile phone towers by imposing restrictions. Installation of towers should be regulated near thickly populated areas, educational institutions, hospitals etc. Sharing of towers by different companies should be encouraged, if not mandated. To prevent overlapping high radiations fields, new towers should not be permitted within a radius of one kilometer of existing towers.

More must also be done to compensate individuals and communities put at risk. Insurance covering diseases related to towers, such as cancer, should be provided for free to people living in 1 km radius around the tower. Independent monitoring of radiation levels and overall health of the community and nature surrounding towers is necessary to identify hazards early. Communities need to be given the opportunity to reject cell towers and national governments need to consider ways of growing their cellular networks without constantly exposing people to radiation.

5. References

1. Sharma, P.L. 1958. Brood rearing activity of *Apis indica F.* and egg laying capacity of its queen. Indian Bee J., 20, pp 166-173.
2. Wellenstein, G.1973. The influence of high tension lines on honey bee colonies. Z.Ange.Entomol., 74,pp 86-94.
3. Warnke, U. 1975. Bienen unter Hochspannung (Bees under high voltage) .Umschau., 13,pp 416-417.
4. Warnke, U. 1976. Effect of electrical charges on honey bees. Bee World.,57(2),pp 50-56.
5. Greenberg, B. Bindokas, V.P. and Gauger, J.R. 1981. Biological effects of a 765 kV transmission line: exposure and thresholds in honeybee colony. Bioelectromagnetics., 2(4), pp 315-328.
6. Brandes,C. and Frish, B. 1986. Production of mutant drones by treatment of honeybees with X-rays. Apidologie, 17(4), pp 356-358.
7. Aday, W.R. 1975. "Introduction: Effects of electromagnetic radiation on the nervous System" Annals NY Acad.Sci., 247, pp 15-20.



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Stockholm, July 9, 2011

California Public Utilities Commission
Cc Susan Brinchman, Director, Center for Electromog Prevention, P.O. Box 655, La Mesa,
CA 91944-0655, USA

To: The California Public Utilities Commission,

I understand that you at present are concerned about the fast deployment of smart meters on homes in California, without adequate sharing of information with the public.

I work as an associate professor at the Karolinska Institute; we are world-famous for our Nobel Prize in Physiology or Medicine, which we many times have awarded to your fellow countrymen and –women. I also uphold a professorship at the Royal Institute of Technology; it being closely tied to the Nobel Prizes in Physics and Chemistry. For many years I have been studying health effects of wireless gadgets, such as Smart Meters.

Wireless communication is now being implemented in our daily life in a very fast way. At the same time, it is becoming more and more obvious that the exposure to electromagnetic fields may result in highly unwanted health effects. This has been demonstrated in a very large number of studies and includes cellular DNA-damage (which may lead to an initiation of cancer as well as mutations that carry down generations), disruptions and alterations of cellular functions like increases in intracellular stimulatory pathways and calcium handling, disruption of tissue structures like the blood-brain barrier (which may allow toxins to enter the brain), impact on vessel and immune functions, and loss of fertility. It should be noted that we are not the only species at jeopardy, practically all animals and plants may be at stake.

Because the effects are reproducibly observed and links to pathology can not be excluded, the precautionary principle should be in force in the implementation of this new technology within the society. Therefore, policy makers immediately should strictly control exposure by defining biologically-based maximal exposure guidelines also taking into account long-term, non-thermal effects, and including especially vulnerable groups, such as the elderly, the ill, the genetically and/or immunologically challenged, children and fetuses, and persons with the functional impairment electrohypersensitivity (which in Sweden is a fully recognized functional impairment, and therefore receives an annual governmental disability subsidy).

Prompted by all this, a group of international experts recently published a very important paper, The Seletun Scientific Statement (2011). Among its points are:

- 1) Low-intensity (non-thermal) bioeffects and adverse health effects are demonstrated at levels significantly below existing exposure standards.
- 2) ICNIRP/WHO and IEEE/FCC public safety limits are inadequate and obsolete with respect to prolonged, low-intensity exposures.
- 3) New, biologically-based public exposure standards are urgently needed to protect public health world-wide.

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4) EMR exposures should be reduced now rather than waiting for proof of harm before acting. It is not in the public interest to wait.

5) There is a need for mandatory pre-market assessments of emissions and risks before deployment of new wireless technologies. There should be convincing evidence that products do not cause health harm before marketing.

6) The use of telephone lines (land-lines) or fiber optic cables for SmartGrid type energy conservation infrastructure is recommended. Utilities should choose options that do not create new, community-wide exposures from wireless components of SmartGrid-type projects. Future health risks from prolonged or repetitive wireless exposures of SmartGrid-type systems may be avoided by using fiber-optic cable. Energy conservation is endorsed but not at the risk of exposing millions of families in their homes to a new, involuntary source of wireless radiofrequency radiation, the effect of which on their health not yet known.

Many smart meters are close to beds, kitchens, playrooms, and similar locations. These wireless systems are never off, and the exposure is not voluntary. The smart meters are being forced on citizens everywhere. Based on this, the inauguration of smart meters with grudging and involuntary exposure of millions to billions of human beings to pulsed microwave radiation should immediately be prohibited until 'the red flag' can be hauled down once and for all.

The recent determination of the World Health Organization (WHO) to include radiofrequent radiation on the 2B list of carcinogens also applies to devices such as smart meters. Already September 4, 2008, the European Parliament voted 522 to 16 to recommend tighter safety standards for cell phones (Europ. Parl. resolution on the mid-term review of the European Environment and Health Action Plan 2004-2010). In light of the growing body of scientific evidence implicating cell phone use with brain tumors, the Parliament said, "The limits on exposure to electromagnetic fields [EMFs] which have been set for the general public are obsolete." The European Parliament "was greatly concerned at the Bioinitiative international report concerning EMFs, which summarises over 1500 studies on that topic and which points in its conclusions to the health risks posed by emissions from mobile-telephony devices such as mobile telephones, UMTS, WiFi, WiMax and Bluetooth, and also DECT landline telephones, and now it is again – and more firmly and seriously - repeated in the form of WHO's recent cancer classification.

With my very best regards,
Yours sincerely,

Olle Johansson, Assoc. Prof.,
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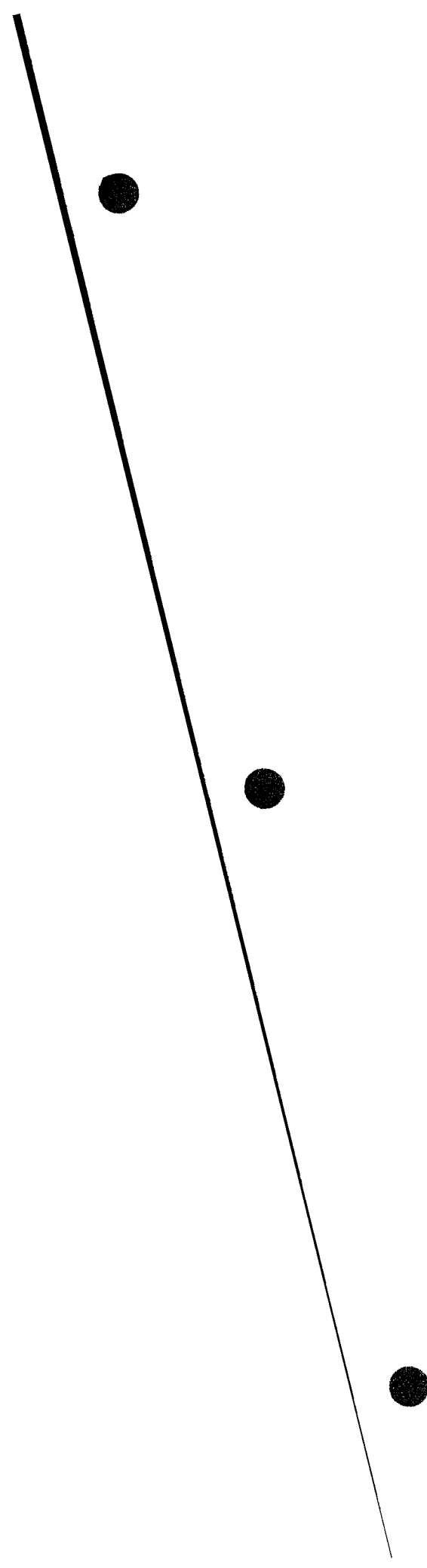
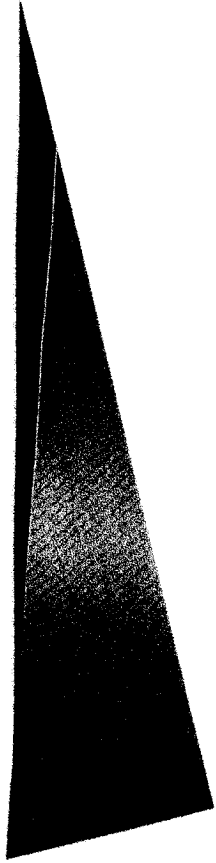
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Demographics

Survey Design & Analysis, 9/13/11
SurveyDNA.com

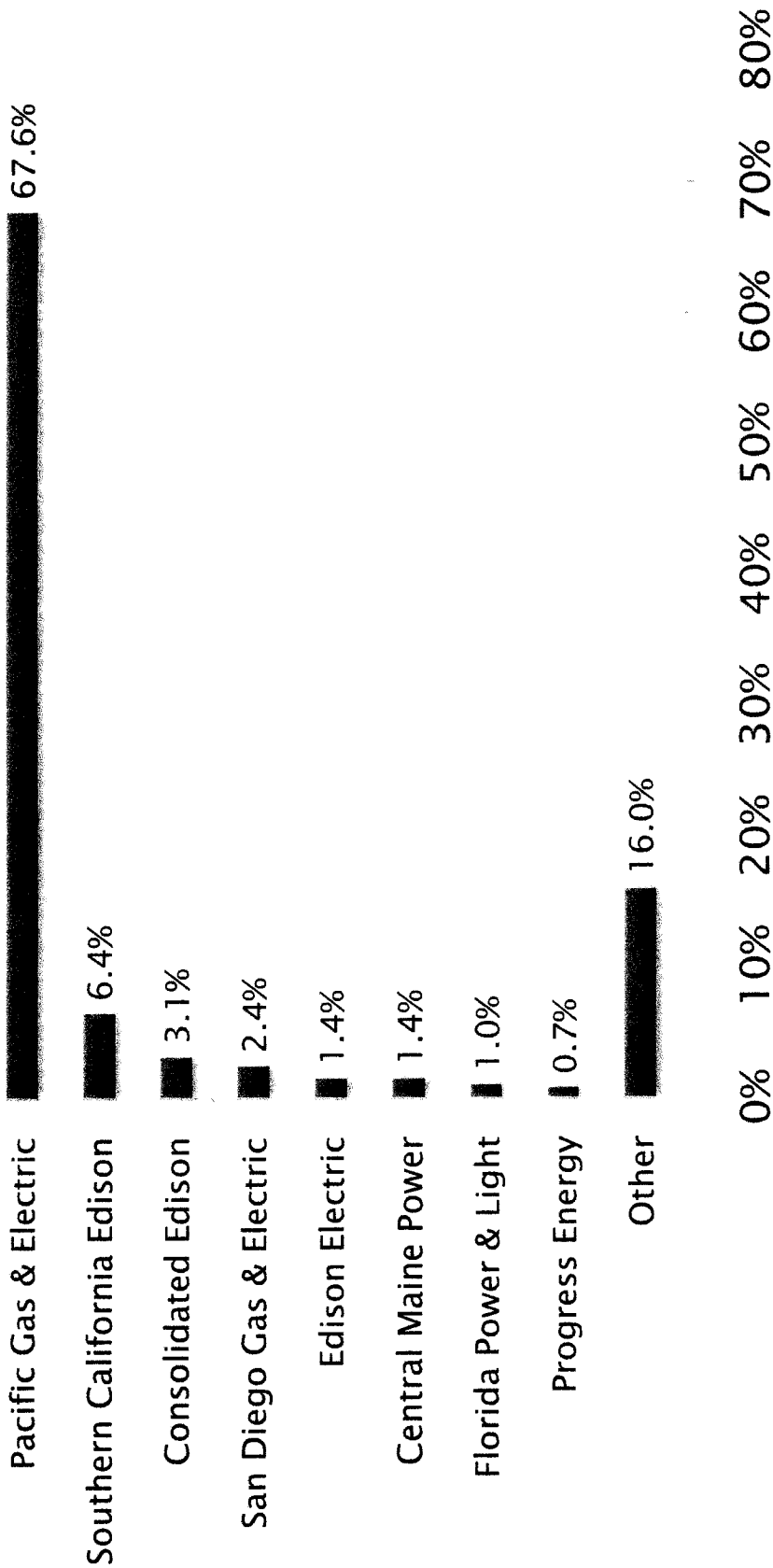


Respondent Gender and Age



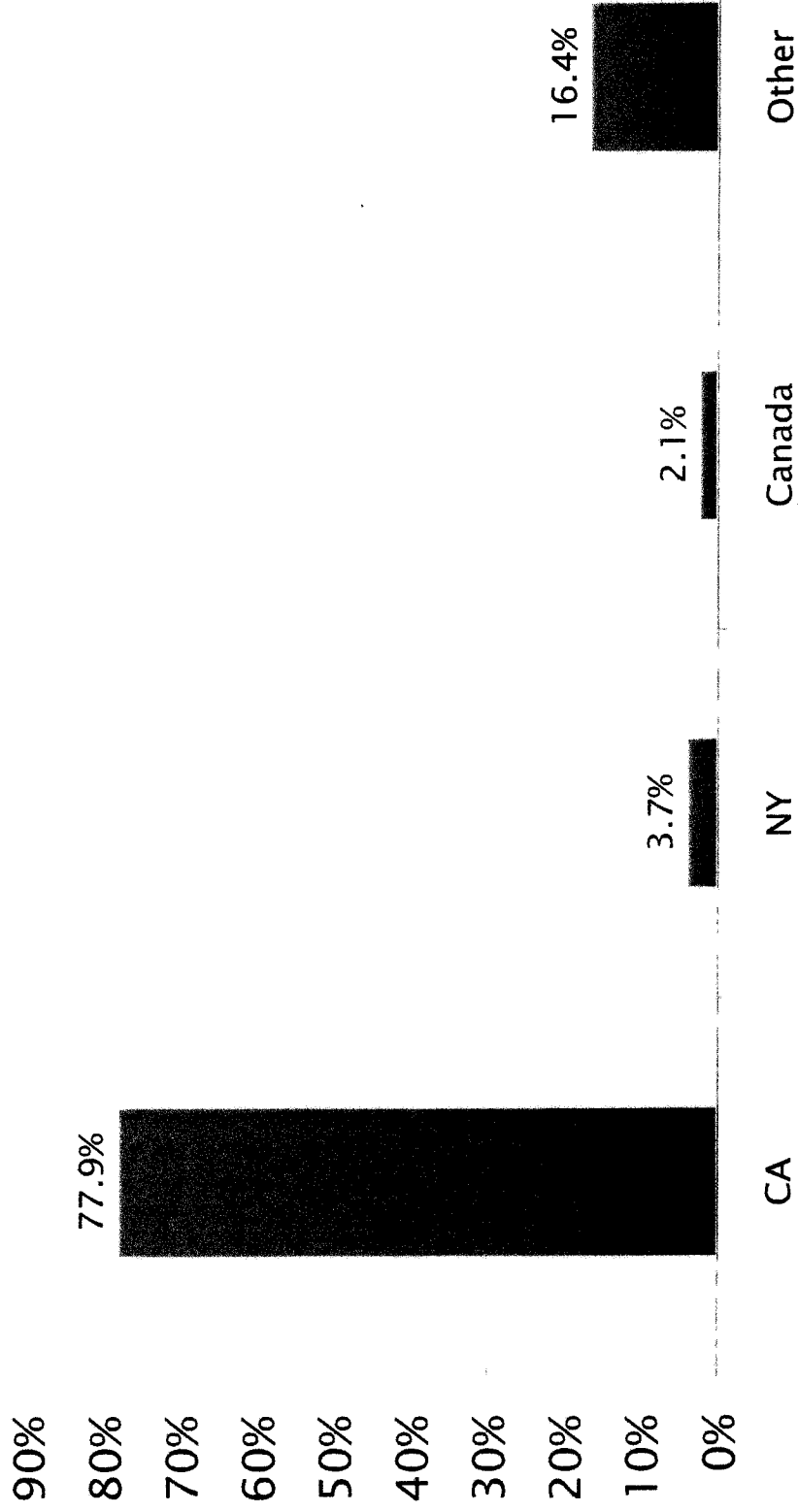
Utility Provider

Please indicate the name of your utility provider(s). N=420



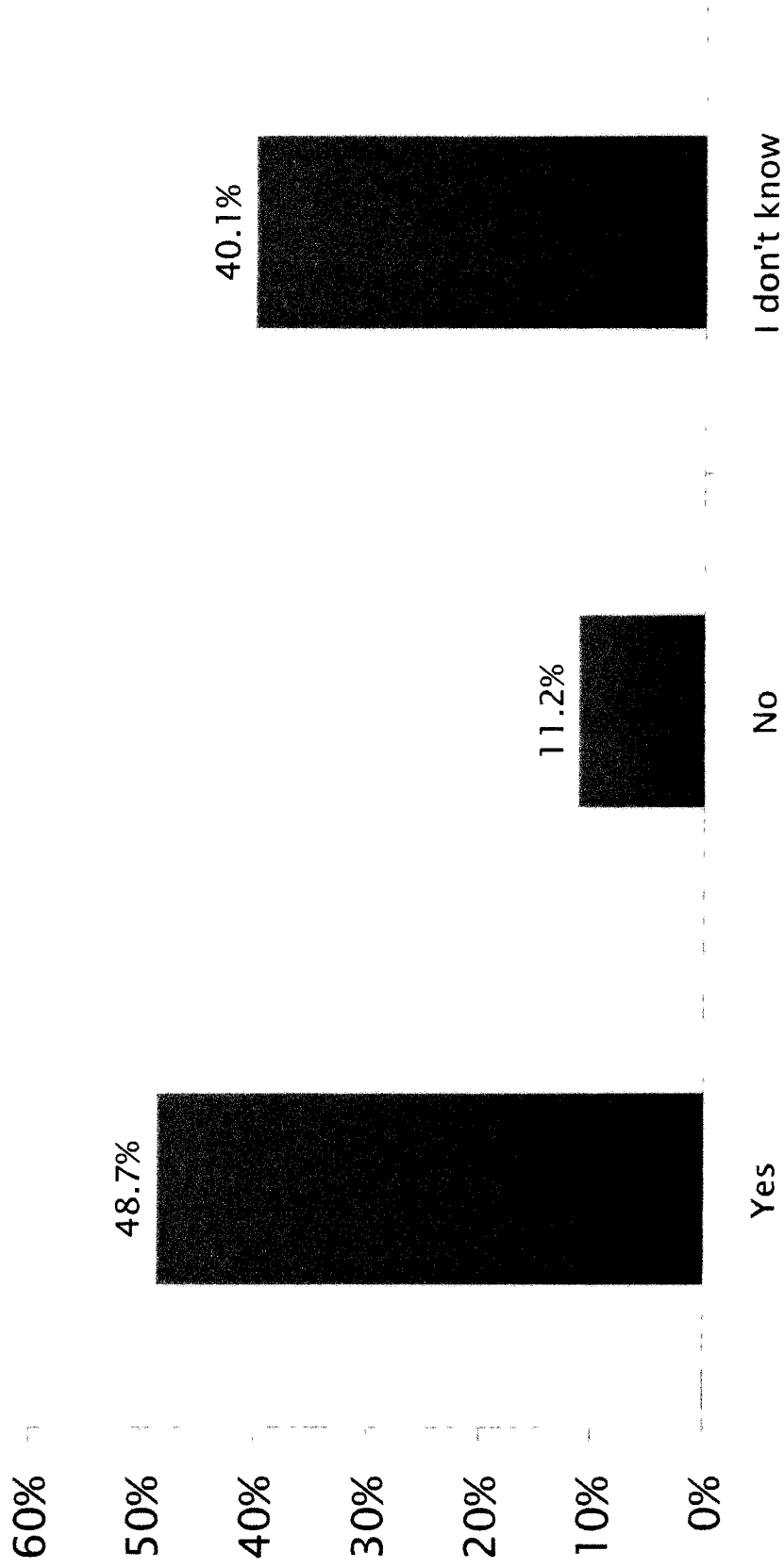
Place of Residence

Where do you live? N=439



EMF Sensitivity

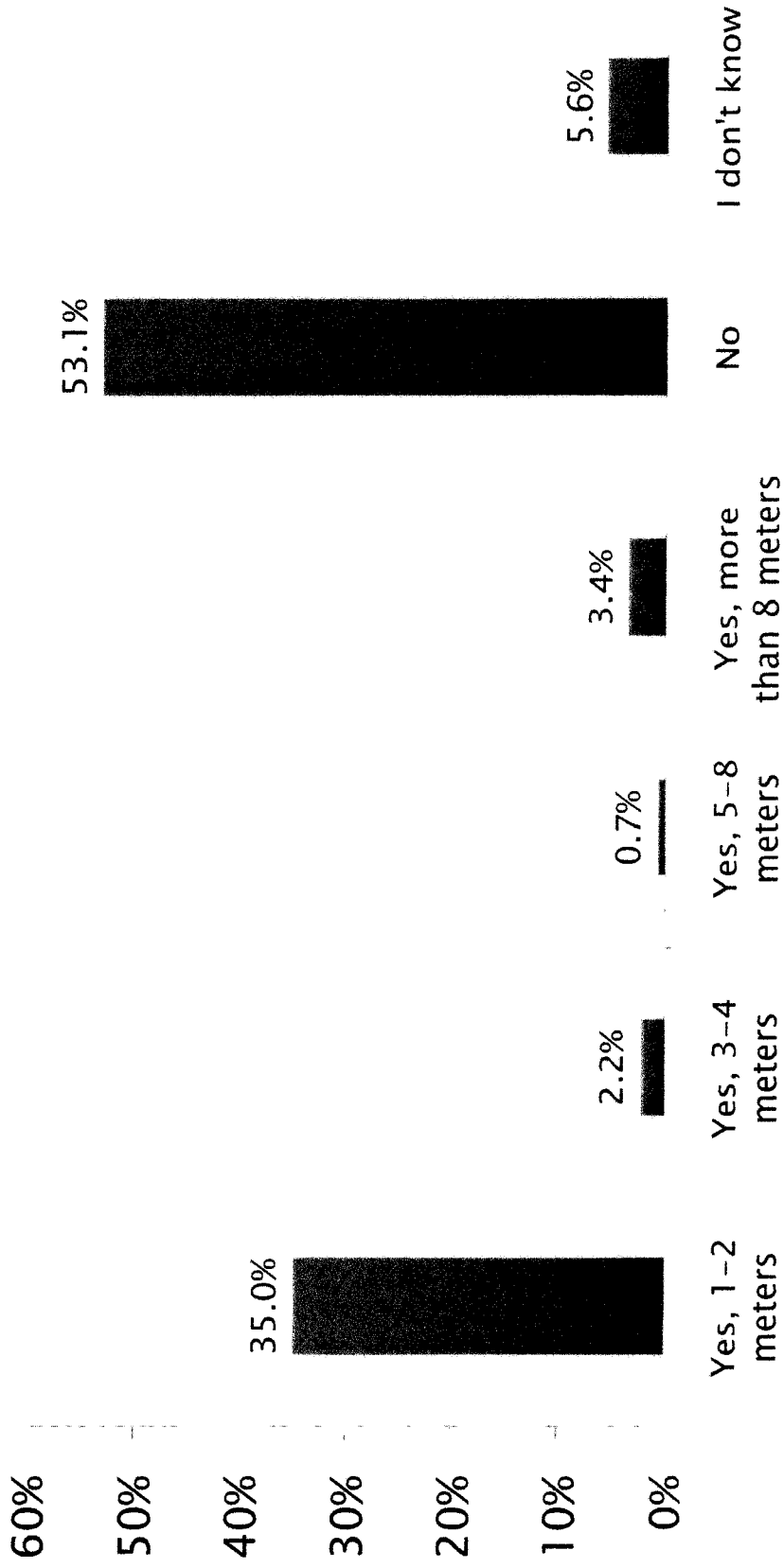
Are you, or is a member of your household, EMF sensitive? N=439



Wireless Meter Installations

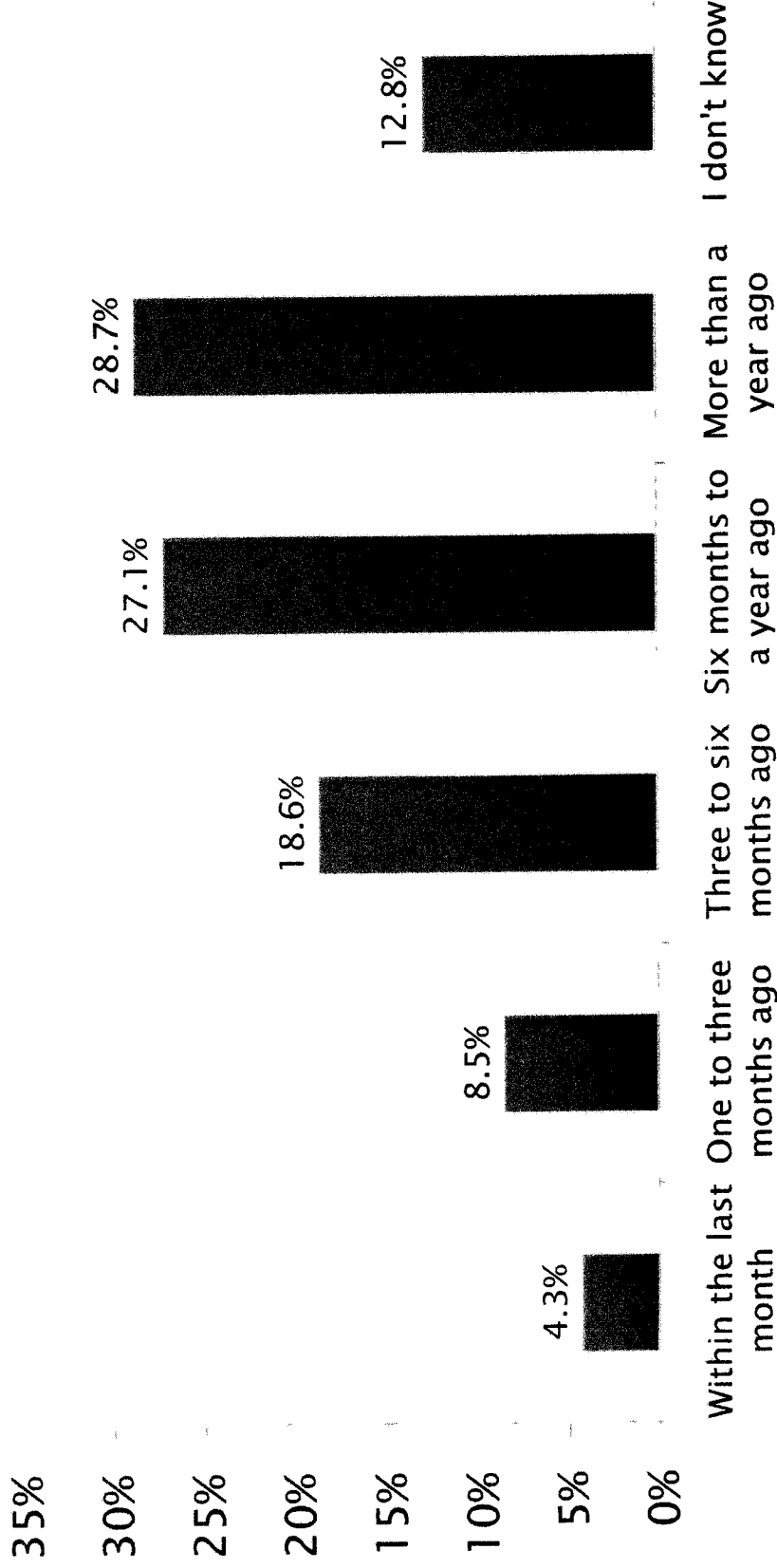
Wireless Utility Meter Installed in Home

Have you had a new wireless utility meter installed on your home? N=409



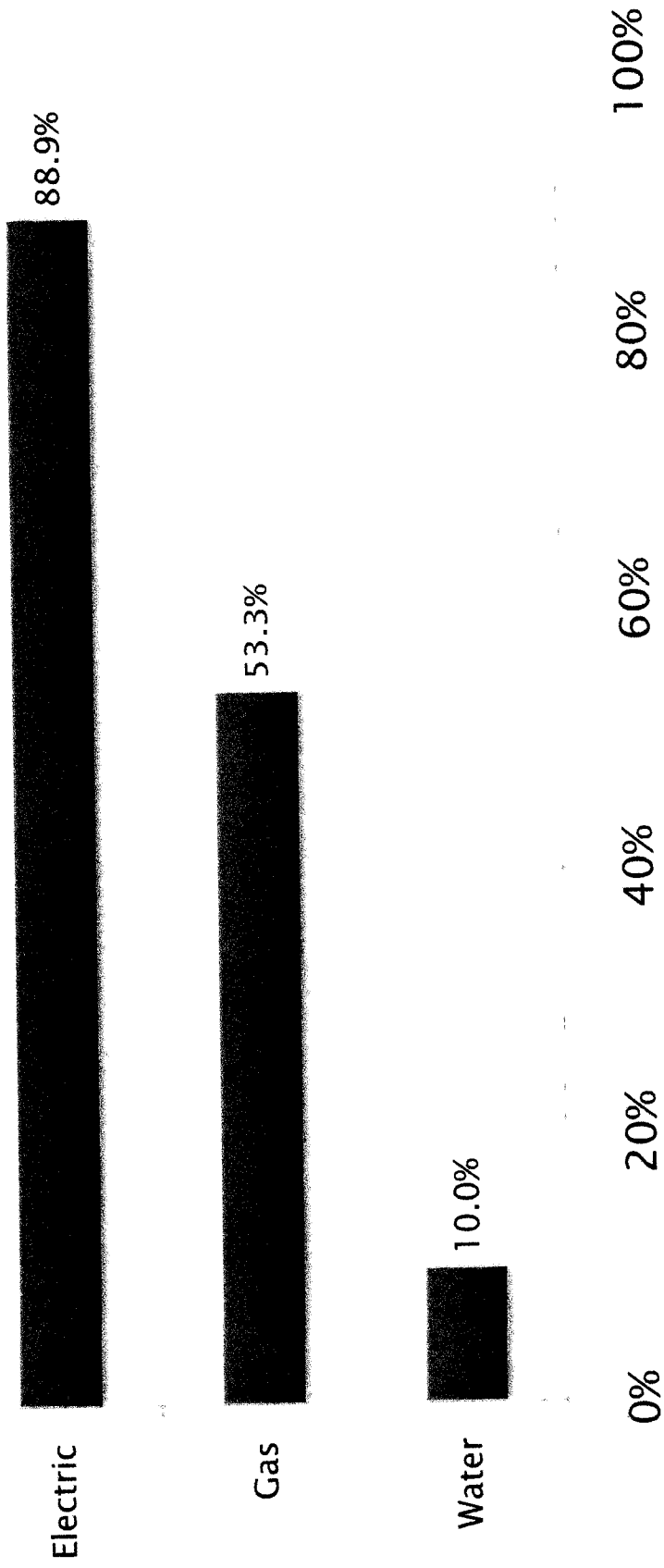
Wireless Utility Meter Install Time

If yes, how long ago was it installed on your home? N=188



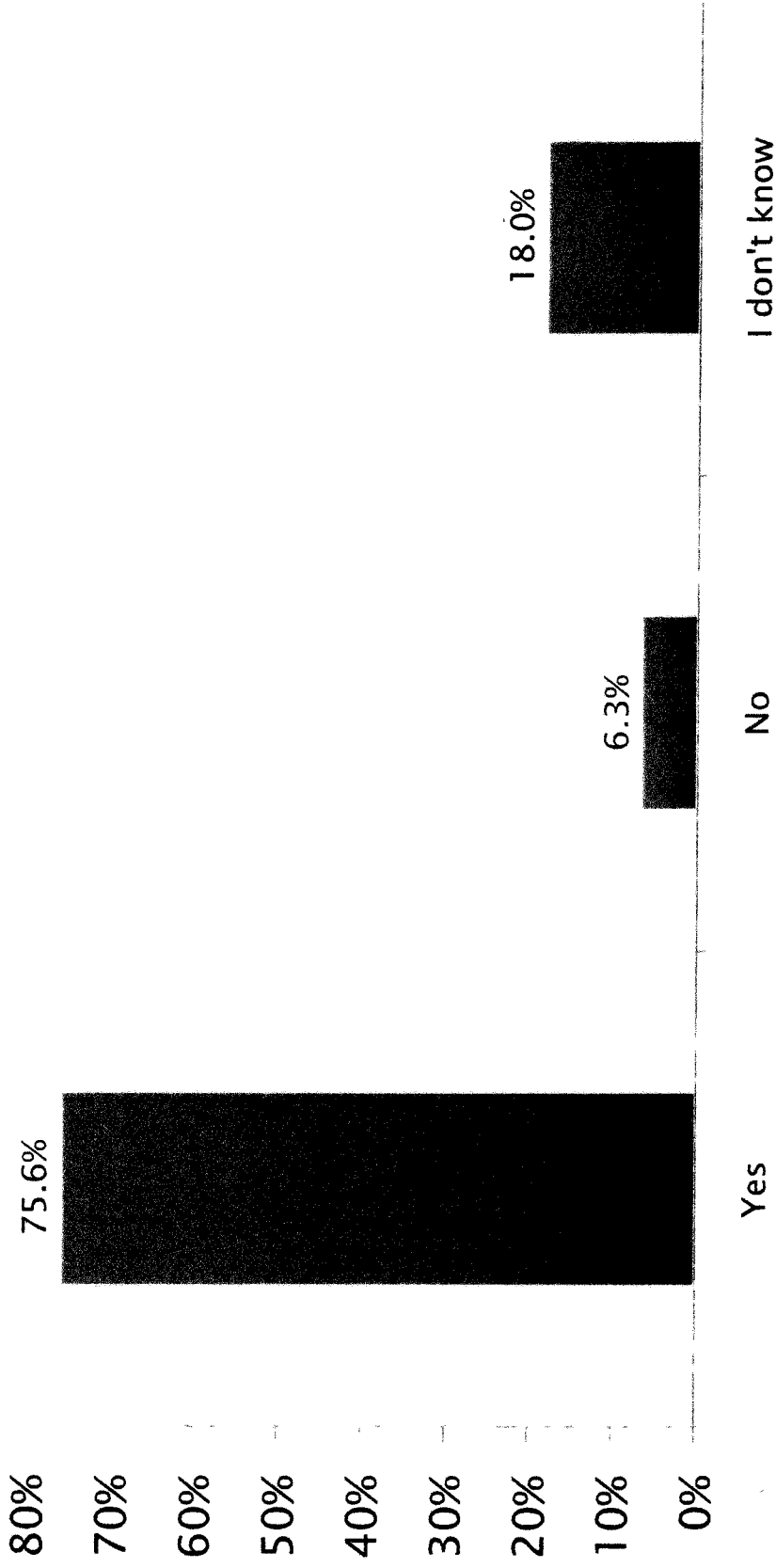
Type of New Meter Installed

If yes, please indicate the type of new meter installed on your home. (Check all that apply)
N=160



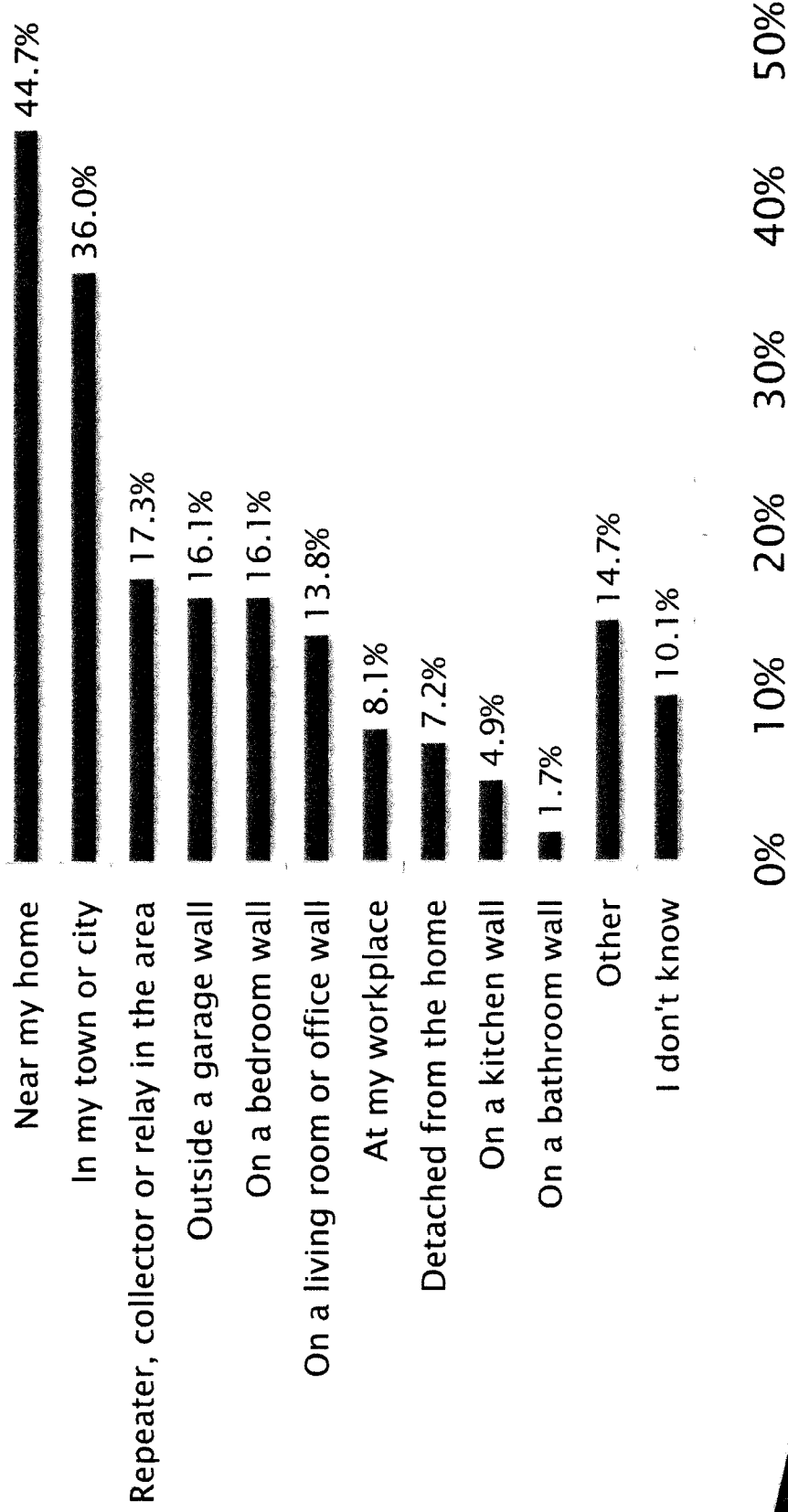
Wireless Meters Deployed Near By

Do you have new wireless utility meters deployed in your neighborhood, apartment building, area, town or city? N=394



Meter Placement

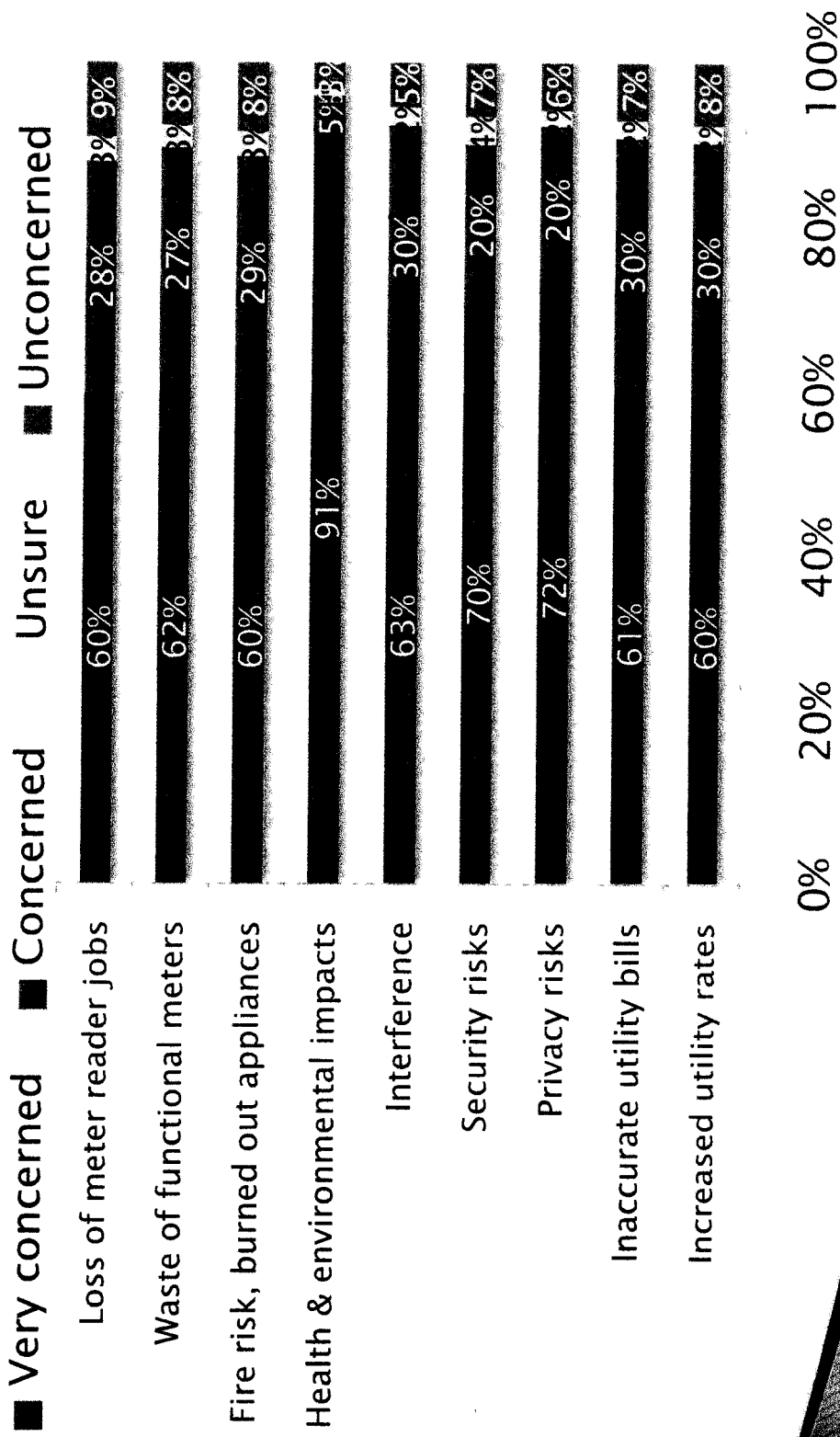
Please describe the placement of the wireless utility meters in relation to where you live.
(Check all that apply.) N=347



Wireless Meter Effects

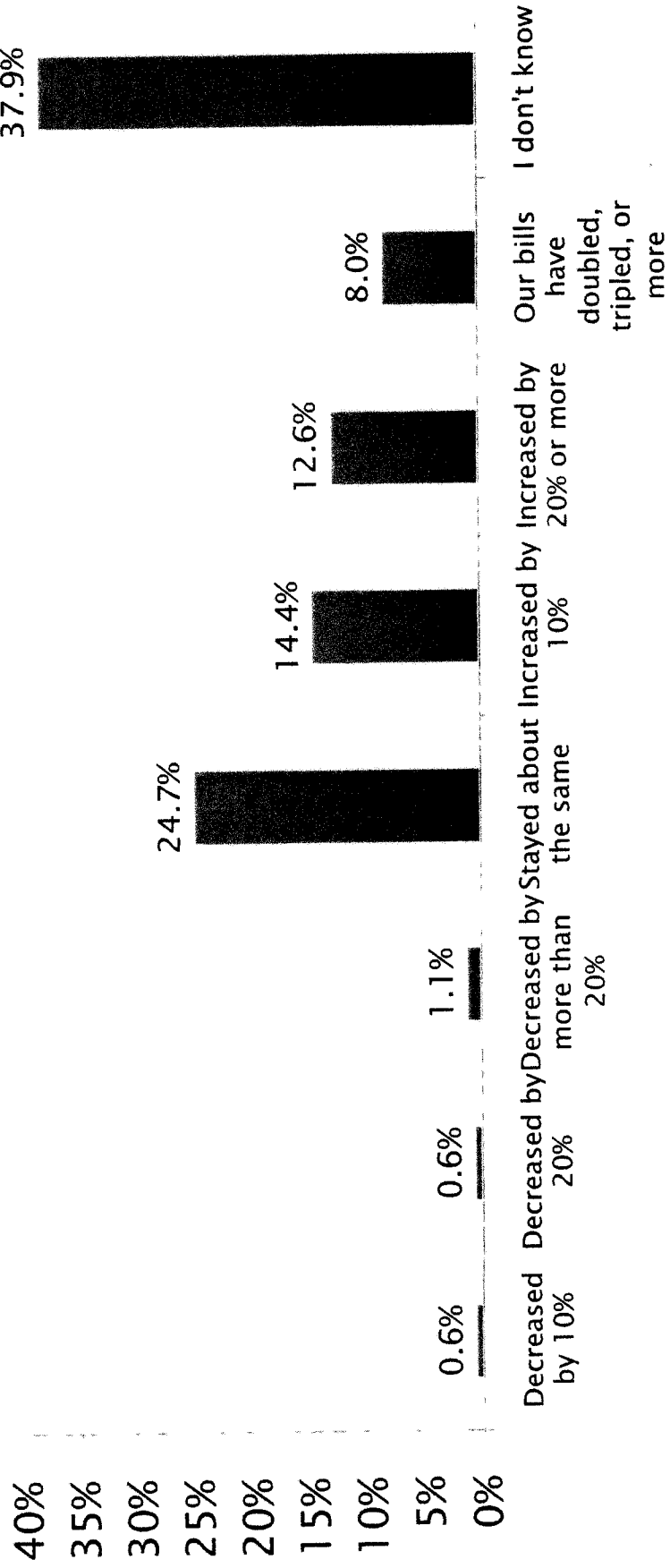
Concern Over Wireless Utility Meters

How concerned are you about the reported problems with the new wireless Smart Grid utility meters, also known as Smart Meters (AMR, AMI, AED)? Check all that apply. N=425-432



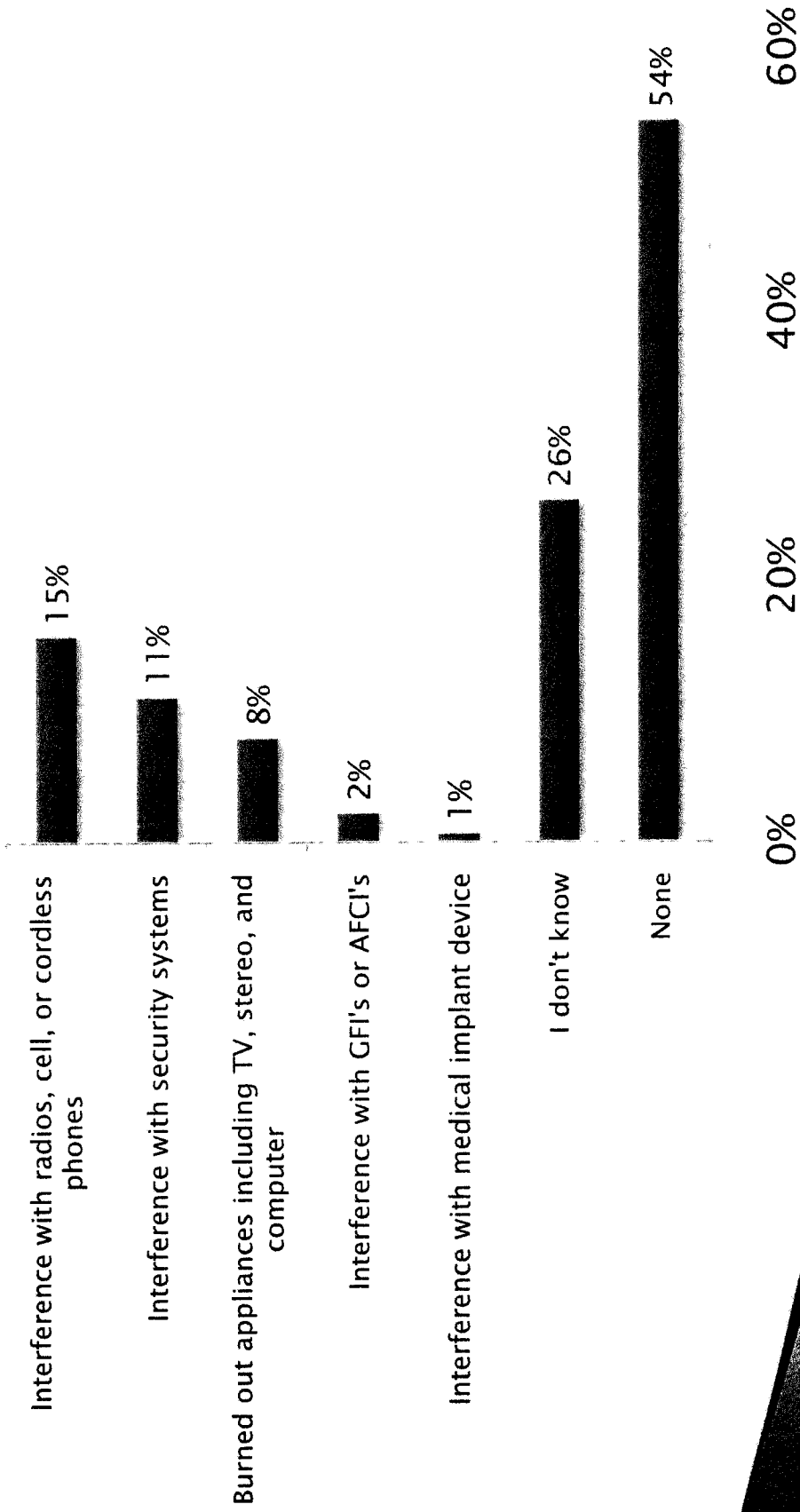
Change in Utility Bill

If yes, have your bills increased, decreased or stayed about the same? N=174



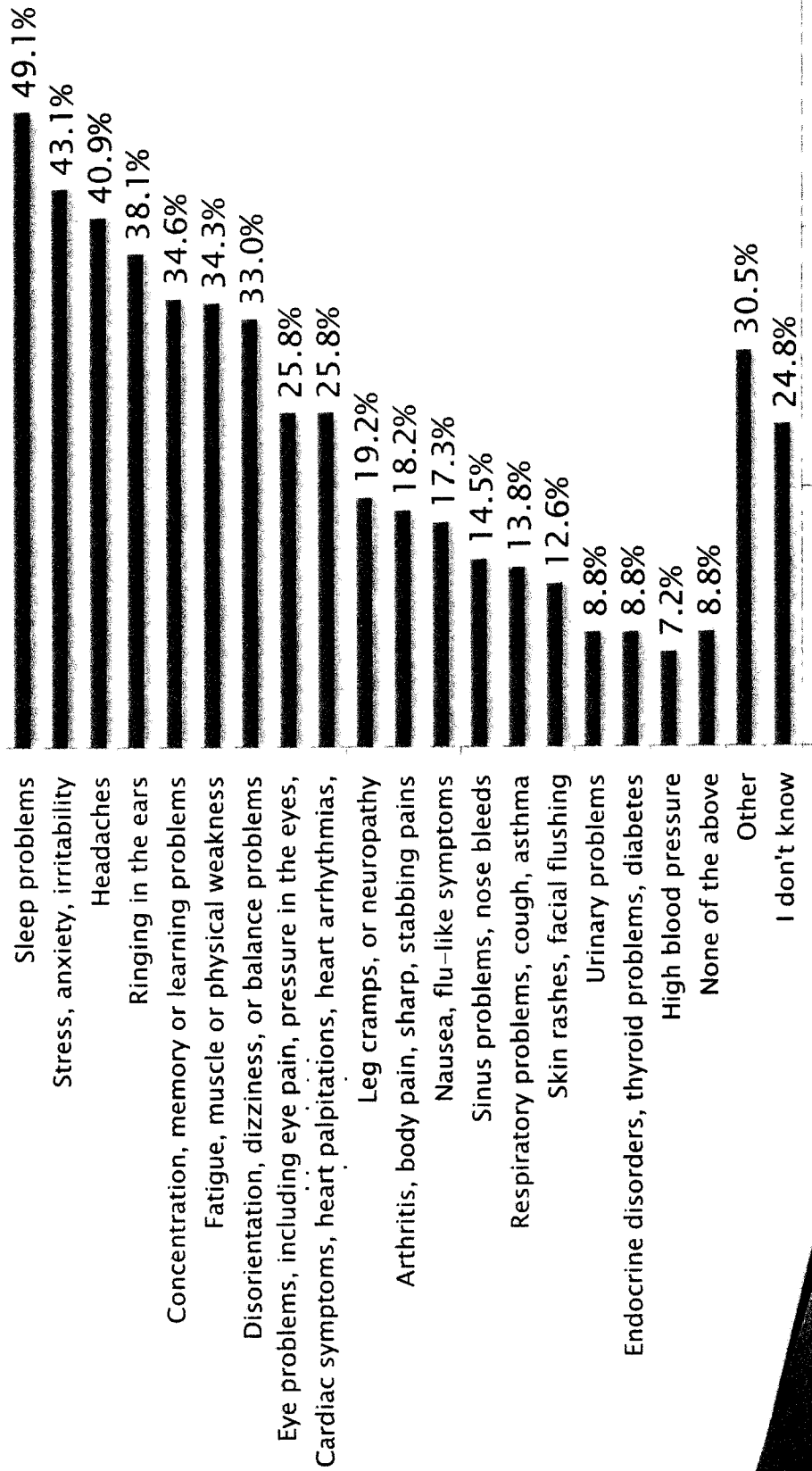
Interference, Damage or Fire

If yes, have you experienced interference, damaged equipment, or a fire since the new meter(s) has been installed? (Check all that apply) N=194



New/Worsened Health Symptom

Have you, or anyone in your household, experienced new or worsened health symptoms since the new wireless utility meters have been installed on your home, in your neighborhood, apartment building, area, town or city? (Check all that apply) N=318



0%

Survey Design & Analysis, SurveyDNA.com 9/13/11

40%

60%
22