

Health risk from wireless? The debate is over.

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The debate on health risks from mobiles, wireless LANs, baby calls and other wireless equipment based on microwaves, is, in fact, over – at least from a professional health and biophysics perspective.

Medical science libraries are stuffed with research reports showing awareness of the health risks for a long time – for many decades, in fact. One example of many is *The Effect of Microwaves on the Central Nervous System* by W. Bergman, translated from German for the Ford Motor Company research lab in 1965, equipped with references largely from the inter-war period:

Bergman revealed all we need to conclude that radiowaves in the centimeter band influence blood circulation, respiration, temperature control, water balance, albumin and sugar concentration in the cerebro-spinal fluid, and so on. The dosages Bergman considered are significantly below today's maximum exposure standards. Even electromagnetic fields (EMF) at levels of only 1/100,000th (10^{-5}) of what we are regularly exposed to from mobiles, are found to disturb the complex electrical operations taking place at cellular levels, and to cause damage to DNA, proteins, neurons and oxidation processes.

Many other lab studies and surveys of large population samples show similar results. The spectrum of possible health problems arising is extraordinarily wide – from brain tumors and leukemia to exhaustion and just feeling uncomfortable - while the causal chains are inevitably complex and contain scores of variable components. Hence, governmental radiation protection offices and the information and communications technology (ICT) business may well claim that the causal chains have not been convincingly mapped, and that, accordingly, there is no need or basis for a revision of the the old elevated thresholds. The findings imply, however, that government and big business have already lost. The debate is over, and the conclusion is clear: We are enveloped by "electrosmog" which contributes to increased sickness rates. Let us roughly suggest that EMF is responsible for two percent of health expenditure in most industrialized countries. In the case of the small country of Norway (population 5 million, with a high incidence of mobile, ICT and wireless net use), that would equal just below \$1 billion US a year.



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Today's maximum exposure standards are set 1,000,000,000,000,000 (10^{15}) to 1,000,000,000,000,000,000 (10^{18}) times higher than Nature's background radiation on Earth's surface to which life on earth has adapted. If we were to establish new exposure limits based on public health, Nature's background levels are most likely what we should aim for. Now, the EU, the European Council, the WHO's cancer panel, and numerous medical conferences - all put on pressure to lower the limits. As recently as 7 Feb. 2014, the Director of the Office of Environmental Policy and Compliance of the United States Department of the Interior sent a harsh letter to the FCC, USA's regulatory body, with the message to get the limits so far down that the health of migratory birds and other wildlife should not be endangered. Lower radiation limits have been studied and proposed in several cities - viz Vienna, Austria, and in Brussels, Belgium. In Salzburg, Austria, a proposition has been launched to lower the exposure limit outdoors to one millionth (10^{-6}) of today's levels, and one ten-millionth (10^{-7}) indoors.

Politicians should now take a look at how to get rid of the old "avoid getting burnt" paradigm that still reigns with the authorities engaged in radiation protection ("How long may you stand or sit in front of a radar before getting burned?"), and replace it with limits based on public health ("How far down may we bring the limits before paralyzing vital societal functions?").

Governments should take a look on how to follow up such a shift to minimal limits. Surely, there will be a lot of regulations to revise, and much food for lawyers.

Academia should look for new areas of knowledge and development: How to "de-develop" wireless society? Incrementally but rapidly, we would presume. What technologies should take over? Or should we communicate less electronically and more in person?

The ICT business should investigate its social responsibility, towards its employees as well as its customers. Questions in this regard might include:

- Which business opportunities seem to open up?
- More optical fiber?
- A renaissance for the old copper wires?
- Open air optical communication systems?
- Any new products and services that might address new demands?

It may be possible to manage these adjustments incrementally, step by step e.g., eliminate wireless technology in schools, classrooms and work facilities; standardize Ethernet connectors on notepads and on mobile phones; phase out WiFi/WLAN in apartment blocks, and oblige the use of wires for household electricity and broadband. Higher placement density, thus reduced output effect of base stations? We think much can be easily done, e.g., that the output power of base stations could be lowered to one millionth (10^{-6}) the current without substantial consequences for society.

Our days will probably not be the same without the wireless world to which we have all got accustomed. The alternative means we all have to pay more and more by sharing in society's expenses on health. That is why health improvements, reduced budgets and business opportunities are waiting at the other end.

Unrealistic? Yes, of course. So was the idea of living without DDT, PCB and asbestos.

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