

**Comments on the Ramazzini study by from Annie J. Sasco, MD, DrPH, SM, MPH, retired
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I am a physician and a scientist having spent the past 35 years working on the epidemiology of cancer and to a lesser extent other chronic diseases. Over the decades, my focus switched from behavioral to environmental risk factors as I was confronted by the huge increase in cancer occurrence worldwide, not only in terms of burden of disease, but also in incidence rates after due consideration to the changes in population size and age structure. As these increases cannot be linked to genetic changes, nor only to behavioral or life-style modifications, and after taking into account the role of screening, earlier detection, improvement in diagnosis and better registration of cancer, increases in the occurrence of many cancers in different parts of the world have to be recognized as a true fact, including in Europe childhood cancer. The most logical potential explanation of these increases is the change in our environment in the past 50 to 70 years. Although some carcinogens always existed, the presence of chemical and physical carcinogens in the air we breathe, the water we drink, the food we eat and objects of daily living exploded. While I recognize the exact quantification of the attributable role of these contaminants in cancer occurrence remains debatable, I contend it is scientifically arguable a non neglectable part may be due to these pollutants. One of the most ubiquitous exposure to physical agents is the exposure to ELF and EMF which has been one of the most rapidly expanding, in particular over the past 30 years and this is accelerating. Soon the exposure to radiofrequency radiations (RFR) will be so widespread that it will be also impossible to find unexposed human populations and human epidemiology will face an unprecedented challenge.

Although epidemiology is often presented as showing limited evidence of carcinogenicity for RFR, my contention is that most epidemiological studies and in particular case-control studies while finding no overall increased risk when comparing exposed to unexposed do find increased risk in the group where it is expected to be found, namely the most heavily exposed, whatever the exact definition is, varying from study to study. This is for example the case of the Hardell studies conducted in the Nordic countries, the Interphone international study and the CERENAT study in France. Such a consistent finding should not be attributed to chance, but rather should be seen as what one can expect, especially because the use of all these objects emitting EMF is relatively new and cancer induction may take decades.

In this context, the information brought by experimental studies, conducted on mice and rats, are of paramount importance. The NTP results released recently found evidence of carcinogenicity in experimental animals for levels of exposures analogous to the ones experienced by humans using cell phones. Now the Ramazzini study reveals similar effects, with brain glial tumors and heart Schwannomas with life-long exposure of rats, from conception to death, to much lower levels of RFR. Some of the results are not statistically significant due to the relatively small number of animals involved. Yet, that does not mean they should be ignored. Larger studies could turn out statistically significant results and in any event statistical significance is just one aspect of evaluation of the relation between exposure and disease. Biological significance and concordance of results between humans and animals clearly reinforces the strength of the evidence of carcinogenicity. The facts that both experimental studies found the same types of rare tumors, which also have pertinence to the human clinical picture, is striking. What's more the Ramazzini study finds this at levels of exposure much lower than in the NTP study. This new study therefore clearly asks the question of the danger

for humans to be exposed from environmental sources, such as cell phone base stations. This publication is a serious cause for concern.

Almost 10 years ago, Dr David Servan-Schreiber and myself co-wrote what is known as the 20 doctors and scientists appeal (Paris, France, June 2008), which was also signed by Dr Devra Davis, calling on people to use their cell phones in a cautious way. We considered at that time there was already enough evidence to advise people to follow 10 measures: when calling, keep their phone as far away from their body as they could; use the loud speaker; keep conversations short; switch to the use of a corded landline when possible or send text-messages rather than talk; avoid any use of cell phone by children and young adolescents; keep the phone away from the bed or turned off at night; when not in use avoid carrying the phone directly on your body or in your pocket, in particular for pregnant women; change side when talking and avoid using the phone when the reception is poor; choose a phone with the lowest SAR; try to stay at a distance from people using cell phones, in particular in closed settings such as cars, trains or elevators.

In the past 10 years many more studies came out. Some may consider there is still not enough evidence. How many more deaths should we wait for? Even if some consider there is still doubt, what is the risk of being cautious? All the recommendations we stated are still valid, even more so than before and the results of the NTP and the Ramazzini studies along with the revelations of the Phonedate that SAR indicated on phones may be misleading are more steps in the direction of advising precaution.

As a doctor, I never forget I took the Hippocratic oath and I obey to the rule "Primum non nocere" (First, do no harm).