Risk Communication Strategies for Possible Health Risks From Radio-Frequency Electromagnetic Fields (RF-EMF) Emission by Telecommunication Structures

Prasana Rosaline Fernandez,1 Kwan-Hoong Ng,2 and Surinderpal Kaur3

Abstract: There is widespread anxiety and speculation about RF-EMF emissions by telecommunication base stations and structures, as it is perceived by some to be unsafe and a threat to public health. Scientists, medical experts, politicians, journalists, and mobile telecommunication company specialists are involved in an active debate on whether people are immune to RF or if we are gambling with our future. Interviews with 31 individuals from 7 stakeholder groups in Malaysia reveal that the residents’ main concerns are that the telecommunication companies do not follow guidelines and as a result the telecommunication structures are constructed close to their homes, which they perceive as a threat to public health. Some residents also do not want these structures because of cultural reasons, while some are jealous over rental income received by the landlords. Meanwhile, the authorities entrusted with safe-guarding public health are involved in a blame game as there is no agency that is clearly in charge. The interviews also highlight that the current risk communication initiatives are more reactive rather than proactive, and that the authorities do not speak in one voice. Based on the outcome of the interviews, eleven recommendations are formulated to improve risk communication initiatives in Malaysia. The recommendations stress on repairing, building, and strengthening trust, because trust in agencies, along with credibility, determines risk communication initiatives’ effectiveness. These strategies can also be effectively replicated across regions to deal with contestations over RF-EMF emissions and the impact on health. Health Phys. 116(6):835–839; 2019

Key words: operational topics; electromagnetic fields; exposure, radiation; risk communication

INTRODUCTION

Radio-frequency electromagnetic fields (RF-EMFs) emissions from base stations and other telecommunication structures are perceived as a health hazard by some members of the public who deem it to be injurious to health (Boehmert et al. 2017). RF-EMFs by telecommunication base stations and rooftop antennas is classified as non-ionizing radiation (NIR) and is believed to be non-carcinogenic, which means it does not have the potential to cause cancer (WHO 2018). Nevertheless, the public’s fears over the years have been exacerbated as a result of conflicting views by both scientists and experts on RF (Johansson 2009).

Adding to the public controversy and media hype, in May 2011 the WHO’s International Agency for Research on Cancer (IARC) classified RF emissions as “2B” “Possibly carcinogenic to humans” (as opposed to 2A “Probably carcinogenic to humans” or 1 “Carcinogenic to humans”). According to the IARC (2006), “possibly carcinogenic to humans” infers there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals whereas “probably carcinogenic to humans” implies there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals. This classification is based on...
limited and hotly debated epidemiological evidence and as such, it has attracted severe criticism from the scientific community who are intensifying the call for precautionary measures (Wiedemann et al. 2013). Furthermore, ambiguity in important information like this makes the public more anxious as the news is difficult for the layperson to comprehend. Hence, Renn (2010) argues for the necessity of risk communicators in the field of health and environment to provide information that is concrete and unambiguous.

The jury is still out given the differing views and inconclusive answers on RF-EMFs from a wide range of medical and scientific research perspectives. Additionally, Wiedemann and Schütz (2008) argue that the conflicting scientific evidence pertaining to RF-EMFs exposure makes the issue of communicating to the public rather challenging. They add that the public’s anxieties and fears on radiation from base stations and telecommunication antennas have become socially amplified resulting in problems in risk communication.

Regardless, there has been a significant increase of exposure to RF-EMFs over the past two decades due to the introduction of new technologies, especially technology related to mobile communication (Kocaman et al. 2018). A spectrum of high-frequency emissions is assimilated in many aspects of telecommunication to cater to new technologies and as a consequence, there is a lot of interest about the possible effects of the radiation emitted from the base stations and transmitters (Pourlis 2009). According to a spokesperson of the Malaysian Communications and Multimedia Commission (MCMC) (personal communication, February 22, 2016), the steady rise in the number of users requires an increasing number of telecommunication structures to ensure optimal coverage, especially in developed urban areas. Van Kleef et al. (2010) describe base stations “as a symbol of societal advance.” They explain that the network coverage provided by these structures have stimulated economic growth, raised living standards, reduced poverty, and is valued during times of emergency. This has resulted in a growth of telecommunication structures in the environment, such as base stations and antennas on roofs, or such structures placed inside or near public premises. MCMC also highlights that residents and activist groups in Malaysia are campaigning against the construction of these structures in residential areas and sensitive areas like schools. The telecommunication companies (telcos) on the other hand, require the construction of these structures to contend with public demand as well as to provide good service with fewer dropped calls. Both MCMC and the telcos have assured the public that the radiation levels are acceptably low and within the international public exposure guidelines set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and Institute of Electrical and Electronics Engineers (IEEE). However, these assurances are being rebuffed by a sizeable segment of the population in Malaysia. This has given rise to the need to explore better means of communicating risks of scientific information to the public.

INTERESTED PARTIES IN RF-EMF HEALTH DEBATES

Ruddat et al. (2010), Boholm (2009), McComas (2006), and Covello (1993) state that the interested parties in risk communication on RF-EMF are government agencies, corporations or industry groups, unions, politicians, the media, physicians, scientists, professional organisations, special interest groups, communities, and individual citizens. Accordingly, interviews were conducted with seven stakeholder groups: government departments/agencies [MCMC, Ministry of Health (MOH) and the local town/city councils], telcos, residents, politicians from the state ruling government and the opposition, activists, media, and experts on RF-EMF from the science, academic, and medical fields, in keeping with Adler and Kranowitz’s (2005) assertion that it is pertinent to understand the views of different stakeholders as they provide “different frames of reference and units of analysis to approach the same issues.”

A total of thirty-one face-to-face conversations were conducted and the discussions were designed to tap on the stakeholders’ different backgrounds and to unfold their experiences and points of view on RF-EMF emission. The discussions touched on the stakeholder’s views on RF-EMF and the impact on health, the stakeholder’s involvement in the health debates on RF-EMF; the stakeholder’s opinions on the roles played by the other stakeholders on this issue; the actions that the stakeholder has undertaken to support his/her stand on this issue; and finally the actions that they want to see in order to help resolve the contestations pertaining to RF-EMFs emission by telecommunication structures.

CONCERNS OF VARIOUS PARTIES ON RF-EMF

The following standpoints emerged from the interviews:

a. The telcos consider the sites for the construction of telecommunication structures important for operations. However, the inference is that they do not adhere to guidelines as the residents are not consulted prior to the construction of these structures as stipulated as a requirement in the guidelines;

b. This creates an erosion of trust as the telcos are not transparent in site assessment and in the construction of the telecommunication structures especially since they are now deemed to be illegal structures. The failed expectation of the actual performance of the telcos has contributed to distrust among the stakeholders;
c. Additionally, the credibility of MCMC, MOH and the local government is affected as these bodies are part of the approval body for the selection of sites for telecommunication structures. This probably explains why the government and the industry officials are viewed by the public as less trustworthy (Markon et al. 2013; Covello 1993);

d. In addition, the approving authorities, the telcos, the politicians from the ruling party, the media and the experts attribute the negative risk perception of residents on their lack of knowledge about RF-EMF emissions. The main issue here surrounds the lack of clarification regarding RF-EMF emissions and the possible effects on humans; the lack of clarity on the one hand, makes the residents amplify the perceived risks while on the other hand, the telcos, media and experts see the fears of the residents as unfounded. A proper clarification of RF-EMF emissions and the possible effects on humans is necessary so that the various stakeholders can be on the same page. The issue is also made more complex with the involvement of politicians from the opposition as this stakeholder group is perceived to be sympathetic towards the residents for an ulterior motive: be popular and win votes from the electorate at the general elections;

e. The pressing issue for the residents (especially those aged 40 y and above) is that these telecommunication structures pose a health risk. The Chinese community does not want these structures close to their homes for cultural reasons (feng shui);

f. The residents also see themselves playing different roles as winners and losers in this health debate. The residents who are landlords and earn rental income benefit from additional earnings and are portrayed as wrongdoers. However, the other residents who live within the vicinity and are exposed to RF-EMF are represented as victims as they are affected in a negative way by the actions of the landlord and the telcos;

g. The media has courted a lot of controversy in these health debates as the residents and the activists look at the media as a source of information and, as an avenue to publicize their frustration to the general public. Meanwhile, the government agencies, politicians from the ruling party and the experts accuse them of sensationalizing the news on RF-EMF;

h. The residents and activists also feel that the experts are not truly independent and have an ulterior motive for supporting the telcos as they rely on financial support for their operations and research;

i. All the stakeholders with the exception of the MOH, are of the opinion that current risk communication initiatives by MOH, who are the custodians of public health, are not effective. They state that the communication on RF-EMF is done on a piecemeal basis with little or no participation of the residents and that the risk communication methods in terms of choice of lead spokesperson, message content and media are ineffective; and

j. The risk managers namely MCMC, MOH and the local government have no clear leader in the risk communication initiatives and hence there is lack of coordination. The managers of risk are involved in a blame game and this has created an atmosphere where there is a lack of trust among the various stakeholder groups.

RISK COMMUNICATION RECOMMENDATIONS

Renn (2010) stresses that people all over the world are concerned about health risks and environmental quality. So, effective risk communication is important to establish “public confidence in the ability of the organization to deal with a risk” (Covello 2010:143). Covello (2010) also explains that there are various objectives in risk communication with the overarching objective being to build, strengthen or repair trust. The other objectives are to raise awareness of a risk, to provide information to the public so that they will be equipped to respond to a risk, and finally to engage people in a dialogue about a risk to arrive at a consensus. The recommendations will touch on all these objectives as the findings infer that these areas warrant attention. The recommendations are as follows:

a. A specific government body from MCMC, MOH and the local councils needs to be appointed to lead in the risk communication initiatives as the risk communication roles among multiple agencies currently lack coordination and clarity. This lack of coordination and clarity has resulted in blame avoidance tactics and power plays among the relevant authorities to evade responsibility. There is a great need to speak in one voice to calm public fears and to quell panic (Clarke et al. 2006). Covello (2010) also advises that it is imperative to “designate who will be the lead communication spokesperson.” It is a difficult task but there is an urgent need for these agencies to put their differences aside in order to address the issue collectively and rationally for a permanent and coherent solution;

b. Stricter enforcement of guidelines needs to be implemented to, firstly, arrest the construction of illegal structures, and, secondly, to ensure that these structures abide by the guidelines pertaining to the distance between the structures and...
neutral reporting with balanced information. This approach provides a less biased view of RF-EMF and also empowers the public to take precautionary methods and still enjoy the benefits of modern technology; f. The cultural norms and values of the Chinese community on feng shui need not be challenged but solutions to deflect bad feng shui energies can be included in the educational talks by a Chinese geomancy expert if this issue is of concern to the residents. This would ensure that all residents’ concerns are attended to and that no issue is trivialized. Risk and the understanding of social systems and actors with diverse values, beliefs, and emotions are crucial in risk communication (Aldoory 2010); g. The text and visuals in the information materials need to be pretested on members of the public to ensure easy comprehension. A panel to oversee the content (both text and visuals) in the information materials should comprise representatives from the public, experts on RF-EMF, representatives from MOH, MCMC and the local councils. A professional advertising agency should also be on the panel for advice if the copy, design, and layout are suitable for the target audience; h. A multi-media approach should be used to ensure that the message reaches the target audience effectively (Covello 2010; Ruddat et al. 2010). The websites/social media on RF-EMF should be advertised to the public and monitored. Information on RF-EMF should be updated online on a regular basis. This makes current information more readily available to the public; i. Media organizations should be included in the risk communication initiatives as the public forms opinions from the media reports on health, environmental and safety risks. As such, MCMC and the telcos should work with the media to create a “more informed, empowered, solution-oriented public” (Lundgren and McMakin 2009). Lundgren and McMakin (2009) also highlight that the media can be used effectively to report existing information, influence the way an issue is represented, bring an issue to the public’s attention or restrict its coverage, propose solutions or take a stand on an issue; j. Risk communication cannot be implemented on a piecemeal basis but must be an on-going process to change the negative perception of RF-EMF on health. Hence, a comprehensive risk communication program should be designed in consultation with the various stakeholder groups. This reflects Hampel’s (2006) view that risk communication is not a task where bits of information are transported from the sender to the recipient of the communication but a process, where both sender and recipient interact in order to develop a common frame for the understanding of the problem; and k. Evaluation of the programs, strategies or tactics should be undertaken after implementation of such initiatives to gauge the outcomes and their effectiveness. It is important to assess the costs and benefits of the risk communication initiatives, identify any loopholes or challenges faced and then fine-tune the programs to achieve better results. Risk communication is a long-term institutional commitment and hence the development and communication practice should be monitored and evaluated for effectiveness.

**Summary**

The recommendations on the health debates on RF-EMF are based on the viewpoints of various stakeholders involved in the contestation. As such, the suggestions may provide a starting point for future risk communication plans where everyone’s voice is not only heard and respected, but acted upon through decisive action. It will require all stakeholders coming to the table in arriving at amicable solutions that benefit all as the recommendations have the potential
to assist the Malaysian agencies involved in risk communication plans. These strategies can also be effectively replicated across regions to deal with contestations over RF-EMF emissions and its impact on health. Additionally, the risk communication guidance described in the literature, and strongly recommended for communications on RF-EMF here may have similar positive impacts in other areas of radiation protection.

REFERENCES


Johansson O. Disturbance of the immune system by electromagnetic fields—a potentially underlying cause for cellular damage and tissue repair reduction which could lead to disease and impairment. Pathophysiol 16:157–177; 2009.


