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## Awareness campaign against cell phone radiation hazard: Case study Oman

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### Abstract

The fast spread of mobile phone usage is a subject of several polemics in terms of adverse health effect such as cancers, headaches and memory loss as shown by recent research. Cell phone's radiation became one of the most pervasive problems worldwide. With the aim of attracting public attention to this issue and increasing awareness in health's dangers and risks of cell phone radiation a campaign incorporating educational strategies and including a logo and poster design by a student of Dhofar University in Sultanate of Oman was initiated. At the completion of this campaign, a mobile phone's radiation influence on peoples' health awareness program was developed and implemented through gearing it to the clinics, hospitals, doctor offices, supermarkets and schools.

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### 1. Introduction

Harmless or dangerous, what about mobile phones? We often have the impression of watching a tennis game between experts.

Currently the health effects of the frequencies emitted by mobile phones are not clearly established and often contradictory. Their impact on human health is not sufficiently understood to justify a limitation of the exposure to RF fields (Santini, 1998). At the same time, recent studies show that the use of mobile and wireless phone technology are related to health problems, severe and serious illnesses. Invisible radiation from cell phones, microwave ovens, computers, cordless phones, electrical wiring in homes, other buildings and offices are all contributors to health problems such as neck and shoulders pain, headaches, brain tumours (especially for children who are less resistant to radiation), hypertension, cancer, brain and eye tumours, Alzheimer's disease, memory loss,

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concentration problems and more. The issue is no longer whether the waves emitted by mobile phones, computers, microwaves, antennas are dangerous to health, but how to be protected and safe. The campaign is targeting children, adolescents, adults, pregnant, men and women to educate them about the dangers of cell phone radiations. A health alert campaign implemented and conducted to influence community norms around health behaviours, awareness and knowledge. The campaign can reach large populations and bring them about long-term behaviour change. The present design work and methodology aims to find out the dominance of mobile phone usage in Oman, and to create part of a public health education campaign called ‘‘Health Alert’’ to explore the information on cell phone radiation risks. In addition to help establish the precautionary approaches to minimize the risk (Sharyn, Potter, Stapleton & Moynihan, 2008).

## **2. The effect of cell phone radiation on health**

### *2.1 The Virtues Of Cell phones*

No bigger than a pack of cigarette, mobile phone, also known as cell phone has revolutionized our life by allowing us communicating wirelessly everywhere at any time. This small electronic device is the combination of two known technologies since the 40s: radio and television broadcasting. Wireless technology gives us the freedom to browse the Internet from all corners of our homes without being in offices. Checking email on the sofa or watching a movie in a bed has become our daily life reality. Mobile phones are now used for local calls rather than international, Internet, email, online banking services. Most of mobile phones are equipped with Wi-Fi system; wireless communication protocol that allows us to browse the Internet effectively and quickly without connected cable to the Internet network.

Long criticized, the mobile phone could have new virtues such as monitoring health parameters, observing online diagnosis and locate injured or sick to hospitalize. Soon, it will be possible to test cholesterol level with smart phone. Researchers at Cornell University in the US have developed a smart phone accessory for giving cholesterol levels in the blood of the user quickly and reliably (Oncesu, Mancuso & Erickson, 2014).

### *2.2 Established risks and unexpected danger*

Despite its many advantages, Mobile phone is considered as a ‘‘health time bomb’’ and people have begun to wonder about the health risks of radiations emitted by cell phones. It has been studies that indicate the danger of mobile phones, one of them is the effect of RF waves on the brain. These radioactive waves are the main cause of brain cancer in the long term taking in consideration that the number of people with brain cancer is increasing. Among the related risks of radio waves technology use, two seem to have a direct impact on our brains. Thermal effects are most palpable. Indeed, continued use of a mobile for 20 minutes increases the temperature of the contacted tissue 1 ° Celsius; it is the cortex, the most sensitive part of the brain, close to the ear and absorbs the thermal fluctuation. Second danger is the issuance by ultra-short wave antenna of very high frequencies emitted at the antenna, which are, absorbed half by the head of the user.

Since the introduction of cell phones, the number of users in the world, in all ages has been increased. Today it would be impossible to imagine life without mobile phones and its offered services (Santini, 1998)

## **3. Precautionary approaches around mobile phone**

Some industry experts predict that we are on the verge of a health crisis that could cripple our current health care infrastructure due to the lack of protection from cell phone radiations and the Harmful effects of electromagnetic fields. It takes years for many of these diseases due to the latency period, but the effects of this highly detrimental force are cumulative therefore ‘‘prevention is better than cure’’ (Cavill & Bauman, 2004)

This biological experiment has gone too far. Many websites and researchers offer a multitude of techniques and methods for reducing our exposure to the radiation of our cell phones. This section lists a series of these techniques

gathered from several different sources. (Pritchard, 2012); Minimize the use of mobile phones, keep calls short, Keep away from your body and head (Greer, 2010). (Kreisberg, 2010), Limit the use of mobile phones by children, Keep mobile phones away from the pocket (Kreisberg, 2010), do not clip it on your belt (Kreisberg, 2010), -Avoid using mobile phones in enclosed metal spaces, Wait for the call to connect, Avoid using if the signal is weak. (Greer, 2010). Don't hold a mobile phones directly up to your head, Use a headset or mode speaker, Turn off your wireless router at night (Child, 2012), Eat green vegetables (Child, 2012), Never put a cell phone up to the ear of a baby (Greer, 2010), charge mobile phones in another room (Greer, 2010), Don't sleep near your mobile phones (Kreisberg, 2010), not allowed for children under 12 (Greer, 2010), Stay more than a meter away from any communication, Communicate via text messaging" (Kreisberg,2010), Change sides regularly.

#### 4. Data collection and results

Ubiquitous Object in our daily life, the mobile phone is the primary means of communication in the world after "direct" communication. Recent statistics indicate that mobile phone subscriber number in the majority of countries is bigger than the population. The mobile phone is now rooted in our daily lives. Mobile penetration has almost reached 200% of the population in some countries such as UAE and continues to grow. The Sultanate of Oman is a very vibrant with 181% penetration on mobile usage. (Dries-Ziekenheiner, 2012)

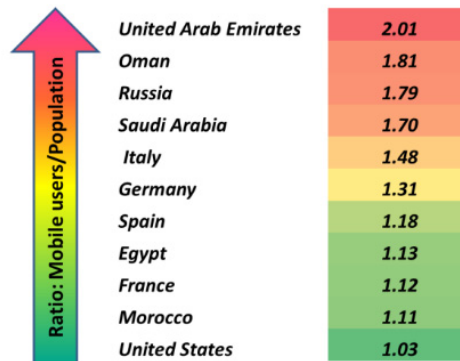


Fig 1. Ratio of mobile users / population in different countries.

#### 5. Suggestion for public awareness; Awareness and health Campaign

The campaign reflects lessons learned internationally in the identification of the most effective messages and development of creative strategies (Kuster, Balzano & Lin, 1997). Today the question is no longer whether the waves emitted by mobile phones, computers, microwaves, cars, relay antennas are dangerous to health, but how to protect ourselves, to help people proactively manage their health and wellbeing by providing free, clear and reliable precautions about cell phone radiation risks. The campaign then is simply a bridge between home and your doctor (Burgess, 2010). Public awareness and health campaign is an essential part of any comprehensive control program reduces in order to put an end to the cell phone radiation risk. In addition, public awareness campaigns may result in changes in the general environment, including encouraging citizens to adopt a positive attitude towards cell phone use precautions (Thorson & Beaudoin, 2004).

##### 5.1 Logo Design

The logo is a graphic element identifying the campaign, a harmonious combination using the main characteristics and symbols of radio frequency, electromagnetic waves and radiations in terms of colour and shape. It is a merging

of words, symbols and signs, which represent an idea to transmit a message to a group of people. The red colour is associated with low frequencies and danger. Dark blue colour is associated with high frequencies. Fig. 2 and Fig 3. (Victor, George, Nicoleta, 2013), (Drew, Meyer, 2008).

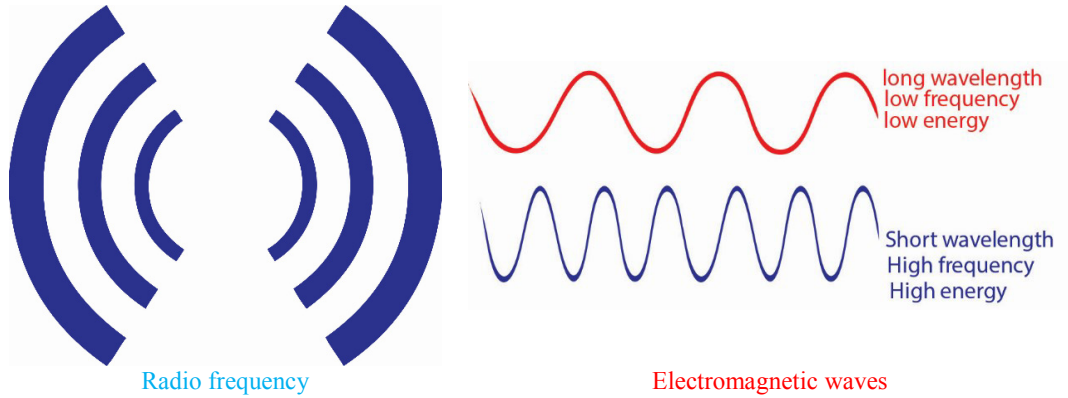


Fig 2 Basic graphic elements used in logo design



Fig. 3: Logo Design for Health Alert

### 5.2 Poster Design

To be able to unit people through graphic images, a visual symbol that is so universally understood by people from around the world was added to the Poster design; the traffic sign of “STOP and give way”, an octagonal red sign which used to give order in addition to the illustration of a family surrounded by RF. The poster design is also including precautions and safety measures. Fig 4.



Fig. 4: Poster Design

## 6. Conclusions

The mobile phone is certainly an extraordinary invention but the debate is still unsolved and there are still many uncertainties about the possible biological effects of electromagnetic radiations. Despite opposing arguments, a simple application of the precautionary principle by simple gesture of everyday life that allows us to protect ourselves largely from potential hazards of cell phone radiation is very important.

This paper is a contribution to help people understand and change their attitudes towards the overuse of cell phones and a call to health organizations to mandate an official ‘‘world anti-radiation day’’ such as ‘‘world health day’’, ‘‘world no tobacco day’’...

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