

## Citywide WiFi and Public Health

Citywide WiFi is going to be an integral part of the modern life. But, electromagnetic radiations being sent by Wireless Routers or WiFi modems to the computers are being increasingly attributed by researchers to cancer, infertility and other health disorders. Especially, children and fetuses are being found to be absorbing much more micro-wave radiations than adults. So, such places with electromagnetic-field radiations of WiFi are most dangerous for pregnant women. Moreover, a tumor may take 2-3 decades to develop. So, it might be sowing the seeds for Public Health problems in the long run, if the AAP party fulfills its poll promise of free WiFi across Delhi. As we all know, one of the major poll promises made by the Aam Aadmi Party during the Delhi Assembly elections for luring the voters via showering freebies at the cost of tax payers' money was providing free WiFi. (Although the AAP government has plans to provide access for only public websites or websites dealing with governance only. Therefore, if one would download a movie or browse YouTube, then the service will be charged.) The plan is to bring entire Delhi under WiFi zone, but, initially only some public zones might be brought under its influence as is the practice worldwide. In the national capital, there are already certain WiFi hotspots like Connaught Place, though the internet speed there is extremely slow.

The Union Government too, under its Digital India Campaign, has ambitious plans to roll out WiFi at select public places in top 25 cities with a population of over 10 lakh by June this year. In this regard, apart from health hazards, the cost implications should also be considered. Currently, even at the airports, free Wi-Fi has been made possible only because the airport administration is footing the bill for it. Indeed, no service provider will give such services for free as it is a huge expense. At the Indira Gandhi International Airport in New Delhi and the Rajiv Gandhi International Airport at Hyderabad, Tata DOCOMO has exclusive agreements with GMR Airports whereby the passengers can access free Wi-Fi service for 45 minutes, following which they have to pay for the service online to continue using the Wi-Fi.

According to AAP leaders, even a downscaled project is likely to cost around Rs 250 crores. The party is said to be in talks with Facebook and other IT companies to develop the project and according to some reports, the government may also mobilize advertisements to generate revenue from the WiFi service. In India, Patna has an 18-km-long WiFi zone

launched in 2013 by the then chief minister Nitish Kumar. It is the world's longest free WiFi zone and one can use the network at a maximum speed of 512 Mbps. It has a bandwidth of 20 Mbps. Now if AAP fulfills its poll promise, Delhi may have such an access across the state either in patches or throughout the state.

Any government can pay the bill for this freebie from tax payers' money or mobilise in part or full, the cost from advertisements. But how would the public bear the cost of health hazards?

Wireless Internet routers or Wi-Fi modems use dangerous electromagnetic radiations to send their signals to the computer through walls. Even if one has a wireless Internet router set up in his home or office (or WiMax, Blue Tooth, Air-Port Extreme, Air-Port Express, Netgear, D-Link, Belkin, Linksys and other wireless network devices) he or she would receive massive EMF exposure, and he/she will be living or working in a dangerous soup of radiation. These antenna radiation patterns have been shown to lead to numerous health problems, more pronounced in children.

Indeed the DSL routers and cable modems that make it so convenient to get wireless online access emit electromagnetic radiations in the low gigahertz frequency level. This level of radiation is also considered by several scientists and health experts as potentially dangerous. In fact, the typical home or office wireless networks transmit radio signals in the same general frequency range as the frequency that microwave ovens use to cook food. At home or office one may turn off the routers, when not in use in off hours or at night. But, the health damaging radiation coming from cable modems and DSL routers at public places which don't get turned off day and night, stay on to cause persistent damage. Connecting your machines to the internet through WiFi whether you're surfing or not, floods total space with harmful EMFs 24 hours and all seven days. Harmful artificial EMFs would be compounding all around you, in all public places or WiFi enclaves. Recently, a physician is reported to have noted that all members of her family were experiencing sleep disturbances, heart palpitations, migraines, and general poor health, since a particular week. She also noticed that the electromagnetic radiation based ill health effects continued on all members on and on. Even after eliminating every other possible cause, these symptoms continued, but when she turned off the router they suddenly felt better. They were lucky that they were not in an area swamped with EMFs from wireless technologies from nearby homes and therefore they could relieve themselves of all those symptoms. When the family switched over to a wired Internet connection, the health problems did not

occur again. The International Agency for Research on Cancer (IARC), part of the United Nations' World Health Organization (WHO), has classified more than 250 agents as Class 2B Carcinogens which may possibly prove carcinogenic to humans. Among such Class 2B Carcinogens, one of the entries is radiofrequency electromagnetic fields (RF/EMF). One of the sources of RF/EMF inter alia is also Wi-Fi devices. Moreover, the RF/EMF, according to a Survey Article published in the Journal of Microscopy and Ultrastructure titled "Why children absorb more microwave radiation than adults", the authors hold that children and adolescents are at considerable risk from devices that radiate microwaves (and that adults are at a lower, but still significant, risk). According to these authors, children and fetuses absorb more microwave radiations, because their bodies are relatively smaller, skulls thinner, and brain tissues are more absorbent. Fetuses are even more vulnerable than children. Therefore, pregnant women should always avoid exposing their fetus to microwave radiations. But, can we stop pregnant ladies and infants from moving in public places pervaded with harmful WiFi radiations? If not, this electoral promise would turn Delhi into a dangerous place, health wise. Should AAP or anyone else have the right to vitiate the entire Delhi atmosphere and turn it into a hot bed of radiation generated epidemic?

Studies are legion to link RF/EMF exposure to different types of cancer, low sperm count, infertility and other disorders. They also report that the average time between exposure to a carcinogen and a resultant tumor may be three or more decades, thus making it difficult to attribute them to EMF or arrive at definitive conclusions. Should we keep on precipitating health hazards for decades and marvel at how Wi-Fi were responsible for the biggest public health crisis in human history?

The effects of RF and WiFi signals on adults and children have been extensively examined. Although in the UK, an independent advisory group on non-ionising radiation, headed by Professor AJ Swerdlow, has produced a detailed report on RF stating that there was no evidence demonstrating "any adverse health effects of RF field exposure below internationally accepted guideline level". But, since it may take 30 years on average for a tumor to develop, establishing a link (if one exists) is too difficult. Thus, precaution and safety is more important, than waiting for any adverse results to precipitate. There is a study considered quite authoritative in UK which talks about lack of any definitive evidence that WiFi signals can be harmful at the current levels of exposure experienced by most adults and children. But, more longitudinal studies are required to verify or contradict the findings about the impact of RF/EMF. But, should we continue to expose us to such fatal risks till

any conclusive evidence comes out, which may be either way? Especially when there are a series of studies attributing all these harms to RF/EMF. For instance, in a study conducted by Atasoy HI, Gunal MY, Atasoy P, Elgun S, Bugdayci G to investigate effects of radiofrequency radiation emitted from indoor Wi-Fi Internet access devices on rats' testes using 802.11.g wireless standards, significant increases in serum 8-hydroxy-2'-deoxyguanosine levels and 8-hydroxyguanosine staining in the testes of the experimental group were detected indicating DNA damage due to exposure ( $p < 0.05$ ). They also found decreased levels of catalase and glutathione peroxidase activity in the experimental group, which may have been due to radiofrequency effects on enzyme activity ( $p < 0.05$ ). Thereby, they concluded in their research paper that these findings raise questions about the safety of radiofrequency exposure from Wi-Fi Internet access devices for growing organisms of reproductive age, with a potential effect on both fertility and the integrity of germ cells.

In another study conducted by Conrado Avendaño, Ariela Mata, César A. Sanchez Sarmiento, Gustavo F. Doncel to evaluate the effects of laptop computers connected to local area networks wirelessly (Wi-Fi) on human spermatozoa, the researchers found that Wi-Fi decreased human sperm motility and increased sperm DNA fragmentation.

Technically speaking, citywide WiFi networks are no more different. One WiFi hotspot can cover a range of 20 meter indoors and for WiFi to cover larger areas multiple overlapping access points are needed. But, in light of its potential health hazards being indicated by many such studies, as stated here above, should the government be allowed to pervade the towns and states with such harmful electromagnetic radiations in the name of poll freebies at the cost of tax payers' money?



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