



Study on Electromagnetic Radiation from Cell Phone Towers and Their Effects on Animals, Plants and Environment

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ABSTRACT: Electromagnetic radiation from Cell phone and cell tower affects the birds , animals , plants and environment. When birds are exposed to weak electromagnetic fields , they disorient and fly in all directions ,which harm their natural navigational abilities. A large number of birds like pigeons , sparrows , swans are getting lost due to interference from the “unseen enemy” , i.e. mobile phone masts. It has also been noted of late that animals used near mobile towers are prone to various dangers and threats to life including still births, spontaneous abortions, birth deformities, behavioural problems and general decline on overall health. Electromagnetic pollution is a possible cause for deformations and decline of some amphibian populations too. Apart from birds and animals, electromagnetic radiation emanating from cell towers can also affect vegetable, crop and plants in its vicinity. This study aims at studying the possible effects of Electromagnetic Radiations on all the above mentioned living beings.

KEYWORDS: Electromagnetic radiation; Cell phone and cell tower; hazards; Environment

I. INTRODUCTION

Of late, Cell phones have drastically increased in number with many companies providing handsets with different specifications for a very competitive rate. Common people are tempted to buy cell phones for various reasons and most of all for the convenience sake. In the last decade, the Indian telecom sector in general and mobile telephony in particular has witnessed phenomenal growth. As on May 2014, of the 938 million connections in the country, 910 million are wireless. The popularity of the cell phone and wireless communication devices has resulted in a proliferation of cell towers across the country[5]. But people seem to have suddenly come with the thought that cell phones and the towers erected for the purpose of transmission cause adverse health effects though they are handsomely paid for the purpose of erecting such towers in their premises. Various studies have also shown and complimented to the views of people regarding the adverse effects of the above mentioned. Our purpose of study is to do a survey on various adverse effects on the radiations emitted by cell phone towers on humans, animals, plants and environment.

II. LITERATURE SURVEY

The Literature review starts with a short review and study on mobile computing. It further enhances to various devices under different capacities..

Preliminary reading in [1] states “ The overall evidence suggests that mobile phone usage of less than 10 years does not pose any increased risk of brain tumour. The effect of still longer use is unclear due to non-availability of data. Any conclusion therefore is uncertain and tentative. Available studies suggest that self-reported symptoms are not correlated to an acute exposure to RF fields, but considering that the studies are carried out over a rather limited duration , it is very difficult to draw any firm conclusions”.

Further in [2], “... extensive research has been conducted regarding possible health effects of exposure to low intensity RF fields. This research has investigated variety of possible effects and has included epidemiology ,in vivo, and in



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vitro research. The over all epidemiology evidence suggests that mobile phone use of less than 10 years does not pose any increased risk of brain tumour or acoustic neuroma.”

Though the first two literature survey states that there is no such significant effects of EMR and mobile handsets, researchers are of opinion that EMR radiations of cell phone towers are harmful and pose threats to ecosystem. This is evident [3] “the cell phone and cell phone towers causes biological effects such as Impact on human body, Cancer Risks, Brain tumors”. This paper also presents a detailed report on various case studies taken from different parts of the word.

In [4], it is proved that “ Both anecdotal reports and some epidemiology studies have found headaches, skin rashes, sleep disturbances, depression, decreased libido, increased rates of suicide, concentration problems, dizziness, memory changes, increased risk of cancer, tumors, and other neurophysiological effects in populations near base stations”

III. METHODOLOGY

Data Collection

In this study we have taken up a brief survey in the areas where the mobile towers are situated , to get a clear estimate of how much of radiations are emitted by these mobile towers affecting the environment , and what are the possible effects the towers have caused on the living beings there.

The study is conducted with the help of Questionnaires and discussions with people. In order to analyse the data collected through the survey, the following tools and methods are used.

A. IBMs SPSS tool:

SPSS is a comprehensive and flexible statistical analysis and data management solution for almost thirty years now. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and conduct complex statistical analysis.

B. Chi Square test

Chi-square is a statistical test commonly used to compare observed data with data we would expect to obtain according to a specific hypothesis. Were the deviations(differences between observed and expected) the result of chance, or were they due to other factors. How much deviation can occur before you, the investigator , must conclude that something other than chance is at work, causing the observed to differ from the expected. The chi-square test is always testing what scientist call the null hypothesis, which states that is no significant difference between the expected and observed result.

Hypothesis:

If p (Pearson Chi Square value) $< .05$, it implies that there is a significant effect on the various factors considered or analysis against the height of the cell phone tower. Otherwise if $p > .05$, it implies that there is no significant effect on the various factors considered for analysis against the height of the cell phone tower.

C. Graphical Representation :

Graphical Representation is done with help of MS-Excel.

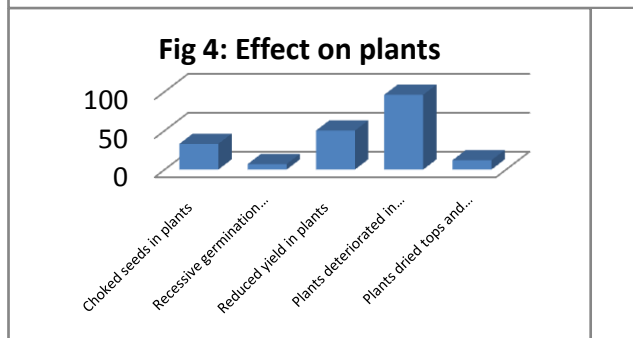
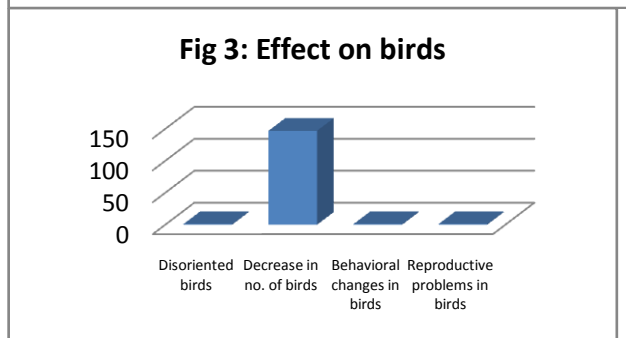
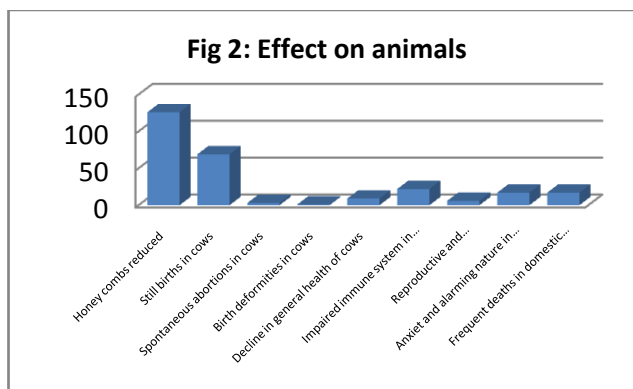
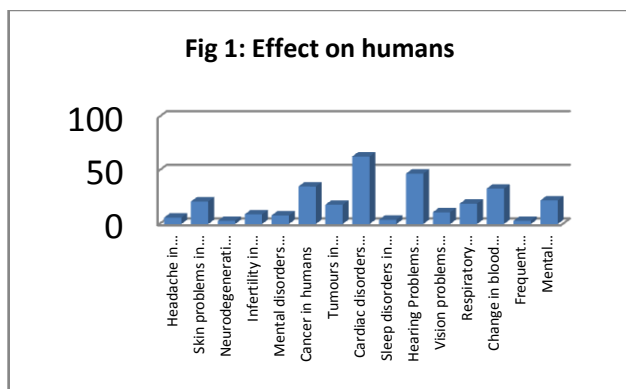
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IV. DATA ANALYSIS AND INTERPRETATION

The following are the graphical representation of the various data analysis done



Through the Chi Square test conducted, we see that p (Pearson Chi-Square) value is less than 0.05 in some of the cases. This implies that there is a significant impact by Height of tower on some of the listed effects on living beings and environment. Accordingly, the results are formulated in the following table:

Effect on humans:

Effect	Chi Square value observed (p)	Observation
Headaches	.290	No significant impact by tower height
Skin Problems	.000	There is significantly high impact by tower height
Neurodegenerative diseases	.075	No significant impact by tower height
Infertility	.430	No significant impact by tower height
Mental disorders	.587	No significant impact by tower height
Cancer	.327	No significant impact by tower height
Tumours	.097	No significant impact by tower height
Cardiac disorders/Blood Pressure	.058	No significant impact by tower height
Sleep disorders	.899	No significant impact by tower height
Hearing problems	.060	No significant impact by tower height
Vision problems	.019	There is significant impact by tower height
Respiratory Disorders	.775	No significant impact by tower height
Change in blood count/Blood sugar levels	.624	No significant impact by tower height
frequent miscarriages	.703	No significant impact by tower height
mentally retarded children	.313	No significant impact by tower height

Table 1: Observations of Chi Square test conducted on effect on humans

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(An ISO 3297: 2007 Certified Organization)

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Effect on animals:

Effect	Chi Square value observed (<i>p</i>)	Observation
No. of honey combs reduced	.000	There is significant impact by tower height
Still births	.000	There is significantly high impact by tower height
Spontaneous abortions	.559	No significant impact by tower height
Birth deformities	.613	No significant impact by tower height
Decline in general health	.000	There is significantly high impact by tower height
impaired immune system	.804	No significant impact by tower height
reproductive and developmental problems	.107	No significant impact by tower height
Anxiety and alarming nature	.000	There is significantly high impact by tower height
frequent deaths	.000	There is significantly high impact by tower height

Table 2: Observations of Chi Square test conducted on effect on animals

Effect on birds:

Effect	Chi Square value observed (<i>p</i>)	Observation
disoriented (fly in all directions)	.000	There is significantly high impact by tower height
decrease in no. of birds in the vicinity	.591	No significant impact by tower height
behavioral changes	.613	No significant impact by tower height
reproductive problems	.925	No significant impact by tower height

Table 3: Observations of Chi Square test conducted on effect on birds

Effect on plants:

Effect	Chi Square value observed (<i>p</i>)	Observation
choked seeds	.633	No significant impact by tower height
recessive germination and root growth	.000	There is significantly high impact by tower height
reduced yields	.001	There is significant impact by tower height
deterioration in no. of trees	.000	There is significantly high impact by tower height
dried tops/slow growth	.325	No significant impact by tower height

Table 4: Observations of Chi Square test conducted on effect on plants

Effect on Environment:

Effect	Chi Square value observed (<i>p</i>)	Observation
Increase in temperature	.515	No significant impact by tower height

Table 5: Observations of Chi Square test conducted on effect on Environment



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V. CONCLUSION AND FUTURE WORK

Conclusion

It is clearly evident that EMR from cell phone towers are hazardous in nature. Though not immediate and rigorous, it is definitely going to be a threat on a long run. People might be satisfied with the services and benefits by using cell phones. But the darker side is also to be considered. As mentioned in the introduction, cell phone industry is now a booming industry. Every lay man is found with more than two cell phones. If this is the rate at which cell phone usage is increasing, definitely in the coming years we will have more number of towers in the vicinity or otherwise more number of amplifiers could be added thus increasing the hazards. Therefore it is absolutely necessary to take some measures to control the radiations or otherwise find a suitable way to counteract with them.

Future scope

The topic we have chosen is a topic with lots of scope with respect to research. The following are the future scopes of the topic if the study and research is continued further

1. Scientific proofs/theories/findings can be supported for all the conclusions done in this work.
2. The survey and study can be extended to many parts of the country by taking various parameters
3. Advanced statistical concepts can be applied in analysis to arrive at more results.
4. Clinical proof is also suggested when it comes to effect on human beings.
5. Though no deviation is made from the original topic given, it can be extended to study the EMR effects of the hand held device also.

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