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NEGATIVE EFFECTS OF AIR POLLUTION ON MENTAL HEALTH

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Abstract:

Because to climate change, there are more days with exceptionally high temperatures. While many studies have examined the association between mortality and temperature, very few have examined the relationship between exposure duration and whether or not it varies even when exposure takes place at the same temperature within a particular month. Thus, we looked at monthly fluctuations in the effect of temperature on mortality as well as heterogeneity within regions in a study that included a wide variety of weather and years. 38,005,616 deaths that took place in 148 American cities between 2003 and 2006 were studied. We construct city-specific Poisson regressions with penalized spline factors to examine the effect of temperature on mortality for each month of the year. We used cluster analysis to find cities with similar weather trends. Next, we combined the data from all of the cities in each cluster using meta-smoothing. Month-by-month variation in the same temperature's impact was notable. There were more effects of heat in the spring and early summer, and more effects of cold in late fall. Additionally, the effects of heat were more noticeable in clusters where high temperatures were not as common, but the effects of cold were the reverse. A temperature's effect on mortality may vary throughout time and space, depending on how unusual it is for that location and period of time. This suggests that differences in temperature variability may have a greater impact on human health than variations in mean temperature as the climate changes. More focus should be placed on warnings that are unique to the early heat/cold temperatures for the season or month rather than just focusing on the extremes.

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1 INTRODUCTION

Throughout an organism's life cycle, water is an essential need. Water purity is crucial since it directly affects human health, ecosystems, and is a fundamental need for any region's growth. But at the moment, it seems that the lack of access to sufficient and clean water to satisfy basic requirements is affecting all living things on the planet, including humans. Today's threats to water resources and the associated ecosystems that support and provide them include pollution, unsustainable usage, shifting land uses, changing climate patterns, and a host of other issues. Poverty and these threats are clearly related since the impoverished are the ones that suffer the most and earliest [1]. The elixir of life, water, is become more and more precious to humanity as a result of poor water resource management. The atmosphere is contaminated by a wide range of substances, including metals, non-metals, hydrocarbons, ions, and different gases. Among all, industries release heavy metals into the land, water, and air [2]. They enter the food chain of humans by environmental means [3, 4]. These substances infiltrate our body and interfere with biochemical functions, sometimes with lethal consequences[5]. Our rivers, lakes, and seas contain a large amount of polluted silt. A portion of these contaminants are released directly by industrial facilities and municipal sewage treatment plants, while others originate from contaminated runoff in urban and small-scale industrial regions and workshop spaces, and still others are a consequence of past pollution [6, 7]. Because contaminated silt exposes worms, crustaceans, and insects to dangerously high concentrations of toxic sediments, which kill benthic organisms and decrease the amount of food available to bigger animals like fish, it poses a threat to species living in the benthic environment [8]. Benthic organisms in the sediments absorb some toxins via a process known as bioaccumulation [9]. Larger animals that consume these contaminated organisms absorb the poisons into their systems, which causes a process known as biomagnifications that impacts the aquatic flora and fauna as the toxins

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move up the food chain in increasing concentration. Hazardous levels of toxic chemical-contaminated sediments, which don't necessarily settle at the bottom of a body of water, may build up in freshwater or marine environments. Sediments may resuspend themselves in the water when anything like dredging stirs it up. Resuspension may result in direct exposure to hazardous substances for all aquatic life, not only bottom-dwelling organisms[10].

The focus of the current effort is the Lake of Sagar and its drinking water sources, which include car garages, dent-painting, workshops, and tube and dug wells close and around the city. Roads and housing, such as homes or huts, encircle about ¾ of Sagar Lake. Therefore, the two main causes of pollution are home garbage that is dumped directly into lakes and high traffic. The air and atmosphere of the lake are constantly being filled with exhaust waste gases from the moving vehicles, which settle into the lake via rain and sedimentation. As a result, water sources such as hand pumps, home tube wells, and dug wells are susceptible to the pollutant's assimilation into the water by capillary absorption [11]. Because they take no precautions while handling or working above optimal circumstances, workers at garages and other work shops, such as painting industries, are also vulnerable to ingesting these heavy metals by inhalation or direct contact[12]. Therefore, there is a chance that heavy metals will be consumed either directly or indirectly by workers in garages, aquatic plants and animals, soil, lake water, and other drinking water sources[13, 14].

There is a fairly lengthy list of hazardous chemicals. It is interesting to note that there are still a lot of situations in which it is unclear whether a certain chemical molecule is harmful or not [15, 16, 17]. Since it hasn't been shown that some beneficial, significant substances are non-toxic, they are subject to strict regulation [18]. Where to draw the boundary between the toxic and essential limits is a legitimate source of uncertainty when it comes to elements, and the toxic essential sub-division is artificial and potentially deceptive [19]. The phrase concentration window is used to define arbitrary lines of demarcation for several metals identified as environmental dangers, including Pb, Hg, Mo, Ag, Te, Sn, Ti, W, U, Zn, Al, Sb, As, Ba, Be, Bi, Cd, Co, and Ce.

2 LITREATURE SURVEY

The "date palm" plant was examined by Al-Shayeb et al. [1] as a biomonitor for lead and other heavy metals in dry environments. Pine tree barks were used to assess heavy metal deposition by Huhn et al. [2]. In Finland, Lippo et al. [3] also found heavy metals in pine bark. Adeniyi et al. [4] have identified Cd, Cu, Fe, Pb, Mn, and Zn in the flora found at dump sites. Mc Intosh and Welz [5] have used flow injection technology to automate cold vapour magnesium studies, therefore aiding in the monitoring of waste water and drinking water quality. A tiny Mediterranean river's potential causes of contamination have all been documented by Dossenakis et al. [6]. The metabolic activity of various metals in various families over a good time period intake has been shown by Nies et al. [7]. Legret [8] has also contributed significantly to the field of water analysis in the vicinity of roadways.

X-ray fluorescence was used by Xie et al. [9] to monitor lead from gasoline fuel usage in plants in both urban and rural areas, while A.A.S. Bucher and Schenk [10] investigated the zinc phytoavailability in compost peat materials. Trace elements were examined in sediment samples from Izmir Bay by Atgin et al. [11]. Whitehead [12] from the Labwater Notes of ELGA has identified ions such halides and Basic radicals. Islam et al. [13] documented the leaching of metals from tropical soil with lake and reservoir water and their quality. Ion chromatography, voltametry, and basic titration are used to measure iron, zinc, copper, cobalt, sodium, and other elements. Al-Shayeb and Seaward [14] have found the concentration of heavy metals in roadside soil samples.

3 METHODOLOGY

Within four hours of the water samples being obtained, the pH of each sample was measured in plastic bottles that had been previously washed with eight milliliters of HNO3. Every sample, with the exception of those collected for TDS and TSS measurements, was promptly filtered to remove suspended contaminants. Eight milligrams of HNO3 (1-2 drops) was also employed as a preservative [3]. Lake water samples were taken from the top, middle, and bottom layers, respectively, over two distinct seasons, from January 2009 to December 2009 and July 2010 to June 2011. In addition, water samples from various drinking water sources in Sagar town were collected. These sources included tap water, dug wells, and hand pumps. Of particular note were the dug wells and hand pumps, which are located in an area with a high vehicle and garage density and a lot of waste from these establishments (including battery repair shops and garages), as well as hand pumps near lakes where there may be a risk of contamination and

from lake water.

There has been much discussion in recent years on potential health issues resulting from exposure to cell tower and mobile phone radiation [1, 2]. Due to the widespread expansion in mobile phone usage, it is now more important than ever to research and evaluate any potential health risks associated with exposure to mobile phone radiation [3]. Researchers argue that radio frequency energy from mobile phones is relatively low and cannot heat the tissues in the human body since it is a non-ionizing radiation found in nature. Consequently, it is thought that compared to those caused by ionizing radiation, its effects on human health should be minimal. Investigating and ascertaining the precise effects of radiofrequency radiation on the human body and health remain crucial. Numerous investigations and studies attest to the effects of mobile phone radiations on the human body, including heat absorption at various body locations [4–7]. However, no study specifically addresses additional potential health problems that may result from exposure to these radiations. Furthermore, there is no proof that the health impacts that have been recorded are solely attributable to these radiation exposures.

The many areas of the human body interact with the electromagnetic radiation (EMR) emitted by mobile phone towers. With several parameters, this interaction is an extremely complicated function. There are two types of health consequences associated with cell tower radiation: short-term effects and long-term effects. The immediate impacts are associated with blood pressure, heart rate, brain electrical activity, and cognitive performance, among other things. On the other hand, the long-term consequences include headache, tinnitus, tiredness, dizziness, headache, muscular trouble, scalp dysesthesia, warmth feeling, memory loss, and visual and epidemiological signs such as brain tumors and cancer [4, 5]. Many people use their cell phones and smartphones for instant communication at work, home, or with specific people. However, few people are truly concerned about potential health risks associated with prolonged use of these devices or what safety precautions might be taken to prevent them. individuals are not sufficiently aware of the health risks associated with mobile phone and cell tower radiation, which may be quite harmful since these radiations expose individuals to EMRs, which are employed in this communication system.

4 EVALUATION

Non-ionizing radiations (NIRs) are radiations with insufficient energy to disrupt the chemical bonds between the various ions and elements that make up the human body. NIR is essentially the same as the electromagnetic field (spectrum) utilized by mobile phone towers and individual phones. Both AM/FM radio and TV broadcast signals employ the same kind of (NIR) fields. Lower amounts of RF radiation are released by cell phones, and some of this energy is absorbed by the human body. The intensity of the RF signal, the distance between the body and the mobile phone, and other variables affect how much RF energy is absorbed. Cell phones should be designed to use the least amount of power necessary to establish and maintain a high-quality call. Cell phones need networks of fixed base stations, also known as cell phone towers, which are often mounted on utility poles and roofs to send and receive radio signals. A mobile phone's transmitting power also changes based on its distance from the cell phone tower, the kind and strength of the network, and other factors. The further a cell phone is from the closest mobile phone tower, the more power it typically has [5]. As this chapter explains, cell phone radiations form fields at different locations and distances that vary in

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strength. As a result, there are stronger fields close to the towers that have a greater impact on human health. Because of resonance and field concentration near the human brain, using a mobile phone continuously has an impact on the human body as well [3]. Due to the widespread use of electrical and electronic technology at an excessive scale in the fields of communication, radar, navigation, radio astronomy, etc., the public is becoming more concerned about the potential health risks posed by radiofrequency radiation (EMR). Bio-electromagnetic refers to the interaction between the human body and electromagnetic fields. We are surrounded by electromagnetic fields from power lines, cellular phones, radio and television transmissions, and other sources.

It's common knowledge that a mobile phone or smart phone has become essential to people's daily lives. The majority of cash has been digitalized, and demonetization in India has greatly increased the usage and requirement of smartphones in daily life. The use of mobile phones has become so prevalent that Indians are now calling for net neutrality. As the number of users increases, the capacity of the communication system must be increased by installing more base stations. In urban areas, base stations are closer together and run at lower power levels; in rural regions, on the other hand, towers are more widely spaced and run at higher power levels. Therefore, the high frequency radiations from various wireless communications systems are always present in our environment.

Mobile phones and cellular phones release microwave-wave electromagnetic radiation. It is a kind of near-infrared radiation that may enter the body via the tissues closest to the phone. This absorbed quantity of RF radiation might vary depending on the communication method being utilized. The kind of usage and the distance between the user and the cell tower antenna are other variables that impact radiation absorption [8]. The mobile phone standard and the regulatory bodies in each nation control the maximum output power of a mobile phone.

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Dielectric heating is a well-known consequence of non-ionizing radiation; in this process, heat is produced in biological tissues by the rotation of polar molecules generated by electromagnetic radiation. The surface of the head is the area that gets heated the most while using a mobile phone due to radiation from the device, which raises the temperature by a very little degree. If the temperature increase in this scenario is smaller than that which results from exposure to direct sunshine, the brain's blood circulation may eliminate the extra heat by boosting local blood flow. However, if this temperature increase is greater than that which is gotten by direct sunshine, the brain will not be able to adapt, which might ultimately lead to health risks.

The mobile communication system's fixed network of base stations and their antennas produce these radiations. The connection to and from mobile phones is provided by these base stations and antennas. These radiations are continually released and much more potent at closer ranges since mobile phone users demand these base stations and antennas to be operational [8]. As the distance between the base stations and antennas, or transmitters, increases, the field strengths of these radiations decrease quickly. The Government of India published recommendations in September 2012 capping the output of electromagnetic radiation (EMR) from mobile phone towers at 450 mW/m . However, this is still far higher than international standards.

For a computer user, computer radiations represent the greatest amount of electromagnetic radiation from a single device. People are used to getting closer to their PCs, so even if the radiation intensity is much lower than that of any line with high voltage electricity, it still creates health problems [8]. The majority of a computer user's day is spent in front of computer displays and other linked electrical gadgets, all of which produce radiation. The radiations coming from the computer are referred to as ELF-EMR, or Extremely Low Frequency Electromagnetic Radiation.

These radiations are comparable to those released by televisions, electrical substations, and power lines. Another

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kind of electromagnetic radiation that is present close to computers is microwave radiation. Basically, microwaves are used to provide radio communication between wireless networked devices including modems, printers, routers, PCs, and Wi-Fi. As a result, the normal user of a computer system is subjected to two different forms of radiation: microwave radiation and very low frequency electromagnetic radiation. The amount of time spent using a computer, the usage of peripherals that release electromagnetic radiation, and the user's proximity to the electronic device being used all have a direct bearing on these exposures.

5 CONCLUSION

Every stimulus that has enough energy to surpass the threshold potential causes the human nervous system to react. The cell membrane is crossed by this stimulus current, causing a change in the resting membrane potential. This is how an action potential is generated. There are situations where the stimulus current is insufficient to cause an action potential to overcome the threshold barrier. This leads to what is called "graded potential," a smaller shift in membrane potential. Hence, depending on the strength of the stimulus current, a neuron may produce an action potential or a graded potential [4, 5]. Additionally, there are differences in the systems generating grade potential and action potential. Since graded potentials are unable to open voltage-gated channels, they permit a continuous link to exist between the stimulus's amplitude and the membrane potential. However, since action potentials activate voltage-gated channels, which actively alter membrane permeability, they provide a discontinuous link between stimulus amplitude and membrane potential.

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