

Harmfulness of 5G Transmission from Mobile Phone Towers

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Abstract- In today's time the world is going digital. In digital world most people use of mobile phone to convey the information, for which towers receive a signal and transmit it back to mobile set. For this, transmission towers emit the radiation. The increased electromagnetic radiation emitted by towers may possibly affect the human health. Radiation penetrates the human body and is absorbed by the human tissues. To know the possibility of harmfulness we calculate the penetrated field in human body for two different frequencies and for different values of power with the help of SAR formula and the results are compared with the permitted whole-body SAR value recommended by different agencies. Calculating the value of specific absorption rate (SAR) for 5G frequencies from transmission towers it is shown that harmfulness increases in higher frequencies of transmission. Harmfulness reaches to longer distances in higher generation of transmission.

Keywords: electromagnetic field, Penetration of field, radiated power, skin-depth, etc.

I. INTRODUCTION

The rapid advancement of technology in recent years has brought about numerous innovations that have transformed the way we live, communicate, and interact with the world around us. Base station towers are required for data transfer. They emit high frequency field in the range of few hundred MHz to few GHz. The electromagnetic field is higher near the transmission tower [1]. They calculate the value of specific absorption rate (SAR) for different distances from transmission tower at different frequencies and results show that the SAR value is increased with decreasing distance and increasing frequency. When radiation fall upon human body, the body temperature increases because some radiation is absorbed by human tissue. The penetrated electric field and SAR values for different tissues at 41 and 202 MHz frequency are calculated [2-4].

The human health problems due to the GSM service providers in the state Jigawa (Nigeria), shows that services provided by Airtel, Glo, MTN and Etisalat telecommunication companies are under the safe limit given by ICNIRP standard [5]. The SAR value and effect of the electric field for human head at 900 MHz and 1800 MHz for SAM (a software model) head tissues are calculated and in this working the monopole antenna was used [6]. The effect of temperature at various frequencies active in mobile phone, shows that the antenna heat raises the body temperature.

Increase in temperature causes much serious effect on human body tissues [7]. The value of power density due to all mobile phone tower across the whole city (Gusau) in Zamfara state was calculated [8]. The increasing use of cell phones for long period of time, harmful effects from EM waves are resulted on human health [9]. Power density, electric field, and SAR for different coordinate at 900 MHz and 1800 MHz frequency are calculated [10]. The value of electric field, magnetic field, and power density around the four directions of cell phone tower are calculate at two distances 50 m and 100 m [11]. These calculations show that SAR value is higher at for larger frequencies. 5G network are being deployed all over the world which uses much higher frequencies for transmission thus increasing the chance of harmful effect on human health. Thus, the area of concern is the potential harm caused by 5G transmission from mobile phone towers. Therefore, in this paper we calculate the SAR for different value of power P at frequencies of 3300 MHz and 4900 MHz (frequencies of 5G spectrum).

II. LITERATURE REVIEW:

Non-ionizing radiation can always pierce the skin while it does not change the human body's molecular structure [12]. Large amount of non-ionizing radiation carry the power to heat tissues in the body. The prospect that the electromagnetic energy is going to enter more deeply grows with a higher concentration of

electromagnetic energy. The skin heat up is an inevitable outcome of this exposure and depending on how severe it is, it may additionally impact on various other organs [13-15]. Radio waves are utilized via a cell phone towers for both the transferring and receiving information. Chronic exposure cosmic ray has been suspected of several type of medical issues especially mental retardation, change in metabolism, consequences for overall health and disturbances in neural activity. There are several and unexpected way to experience of radiation contamination in the atmosphere, consequence of the developing technology required to support 5G connections and increasing proportion of smartphone owners. These weaknesses are aggravated by an increasing variety of communications satellites.

A lot of creatures, especially human beings show health ramifications associate with these exposures, even when they are barely detectable rates corresponding to contemporary environment [16-18]. It is help to understand the peculiarities of the EMF propagation of ground state along with maximum voltage energy transfer poles and to assess the relevant human susceptibility to such areas in order to ensure the secure use and examination of communication pole [19].

A number of investigations have projected the optimum EM radiation generated by LTE towers via determining radiant area magnitude produced by coordination indications and a result of these studies the radiation properties of base station as well. Since cellular ray helps it simpler to stay in touch, share information and execute surveys, here is a considerable data to show classic and modern Bluetooth communication eras my possess negative consequences on health of individuals. These illustrates the importance to meticulously evaluate and limit radiofrequency radiations to safeguard the welfare of people [20]. The influence of EMF exposure, the variation of temperature, SAR and electric field within the various body part has been researched. This investigation revealed that when bombarded by electromagnetic energy, the dielectric feature of the cells exerts an enormous effect on how energy is circulated into the body tissues. These are provided vital data towards

restricting the energetic released by transmission device, establishing calculate secure boundaries separating human beings and those type of device to make sure exposure stays outside acceptable limits [21-22].

Extending the number of base stations in a certain region, notable at the 28 GHz frequency, enable an innovative means to regulate the contact with electromagnetic fields. This evolution provides it achievable to reduce radiation exposure via a specific method. These results encompass PD, conductivity of electrical current, permittivity value, frequency range, SAR, temperature and amount of EMF. It is conceivable to limit and decrease the adverse impact of radiation on human wellness despite sustaining optimum network performance by controlling above factor [23-25]. Although numerous antennas pole has been constructed to endure high power and frequency emission from ground stations the EM field encircle them is complicated compared to one another routine energy transfer towers. The fact that people face exposed to more powerful amount of EMF, assessing these towers becoming harder to do. Significant and shockingly solid proof implies an increased danger several types of cancer in adults, whereas a lot of the conversation concerning whether EMF push the possibility of cancer has focused on leukaemia in kid [26-27].

III. MATERIAL AND METHODS

Electric field around mobile phones transmission tower

The electromagnetic fields in the microwave frequency domain which are usually released by mobile phone towers have a maximum intensity close to the towers and decrease with distance since the intensity of these fields is inversely proportional to the square root of the distance. The electric field E, value at a distance r from the power P vertical transmitting antenna but antenna length $l \ll r$ so that propagated wave front is spherical, is given by following equation [28-29]

$$E = \sqrt{\frac{P}{2\pi r^2 \epsilon_0 c}} \quad (1)$$

Where, ϵ_0 = permittivity of free space, c = speed of light

This indicates that the electric field changes inversely proportionate to the square root of the transmission tower's distance.

Penetration of electric field into human body

The permeability, permittivity, and radiation frequency all affect deeply a field penetrate human tissue when it is exposed to radiation. Consequently, the field caused by the incident electric field, E , on the surface at a depth, d , is given as [30]

$$E_i = E e^{(-\frac{d}{\delta})} \quad (2)$$

Where, δ is the skin depth, it is given as

$$\delta = \frac{1}{a\omega}$$

$$a = [\mu\epsilon \{ (1 + s^2)^{1/2} - 1 \} / 2]^{1/2}$$

$$s = \sigma / \omega\epsilon$$

Specific absorption rate

The Specific absorption rate (SAR) is given by

$$SAR = \frac{\sigma E_i^2}{\rho} \quad (3)$$

Where, ρ is the mass density of the tissue material.

IV. RESULTS AND DISCUSSION

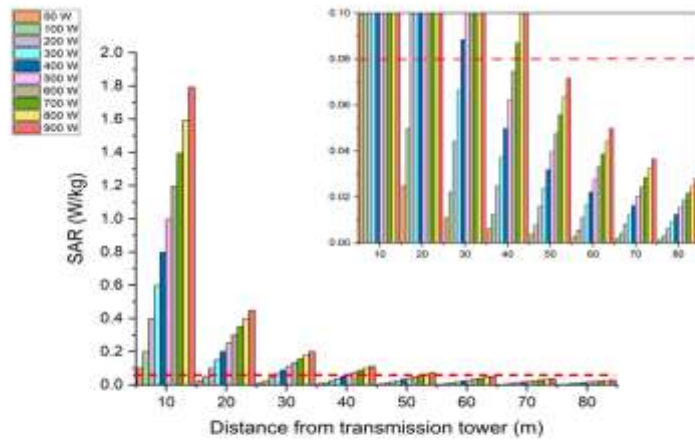
The emergence of 5G technology has ushered in a new area of connectivity with possibilities for larger bandwidth and internet speeds. However, the potential harmfulness of 5G transmission from mobile phone towers cannot be dismissed lightly. The resulting SAR, i.e., absorption of electromagnetic field in the human body at different distances from mobile transmission tower at 3300 MHz and 4900 MHz frequencies at different transmission powers are calculated and given in Figure 1 and Figure 2. To enhance the understanding of the harmful range of Specific Absorption Rate (SAR) at 0.08 W/kg, magnified portions of each graph have been depicted. These

detailed views highlight the critical areas where SAR levels can become potentially harmful, providing a clearer visual representation of exposure thresholds. This allows for better comprehension of how even small increases in SAR can affect biological tissues.

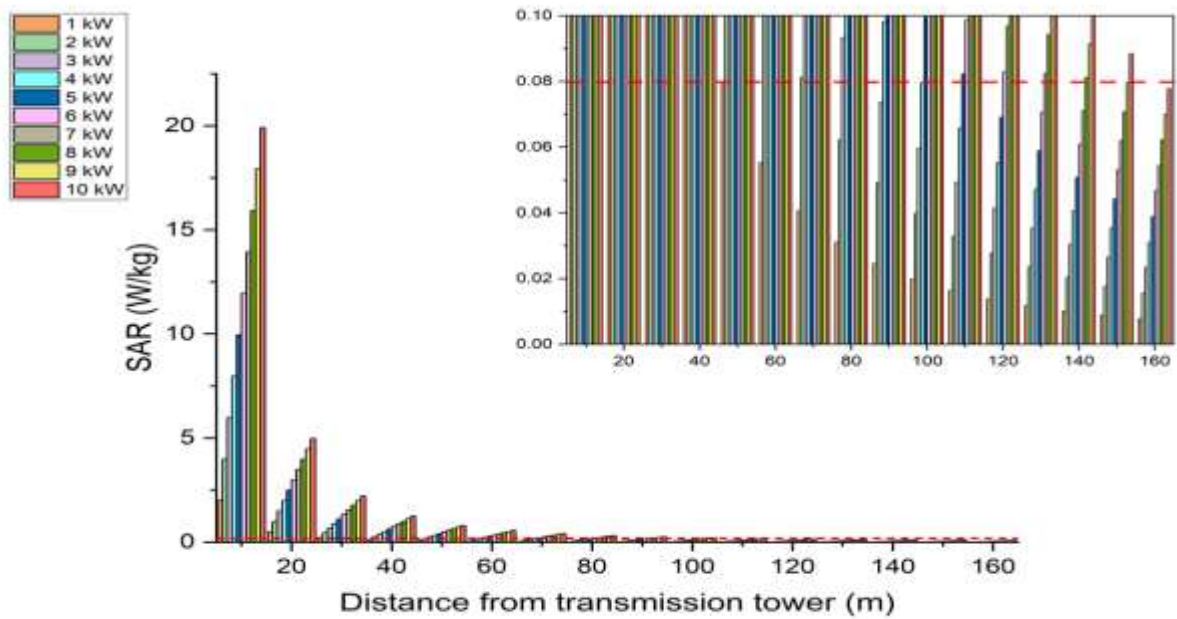
The results shows that SAR values increase with increase of power and decrease of distance from transmission towers. The resulting values of SAR are compared with safe exposure limit for whole body SAR 0.08 W/kg as recommended by world health organization (WHO) [31], Federal Communication Commission (FCC) [32], International Commission on Non-ionizing Radiation Protection (ICNIRP) [33], the Institute of Electrical and Electronics Engineers (IEEE) [34], National Council on Radiation Protection and measurement (NCRP) [19], Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) [35] etc.

The values more than permissible limit are shown in Figure 1 and Figure 2 is representing the comparison of two frequency 3300 MHz and 4900 MHz at power show the safe distance from the transmission towers decreases on increasing the frequency value, for same frequencies SAR variation with different power shows safe distance limit is decreasing by increasing in frequency as well as power, these results shown in figure 3, i.e., the people are affected up to lager distances from transmission towers.

This shows that shifting to 5G is going to be more harmful for human as also to other biosystems including birds and animals. Scientists all over the world are opposing the switch over to 5G transmission, but governments are in race to introduce it faster in their countries. Many countries are even considering 6G, which is going to produce havoc throughout the world.



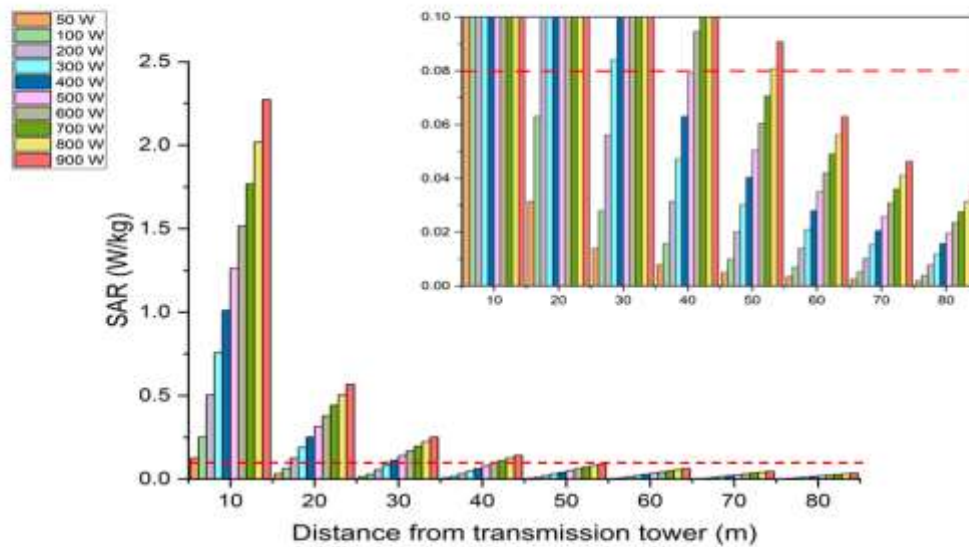
1(a)



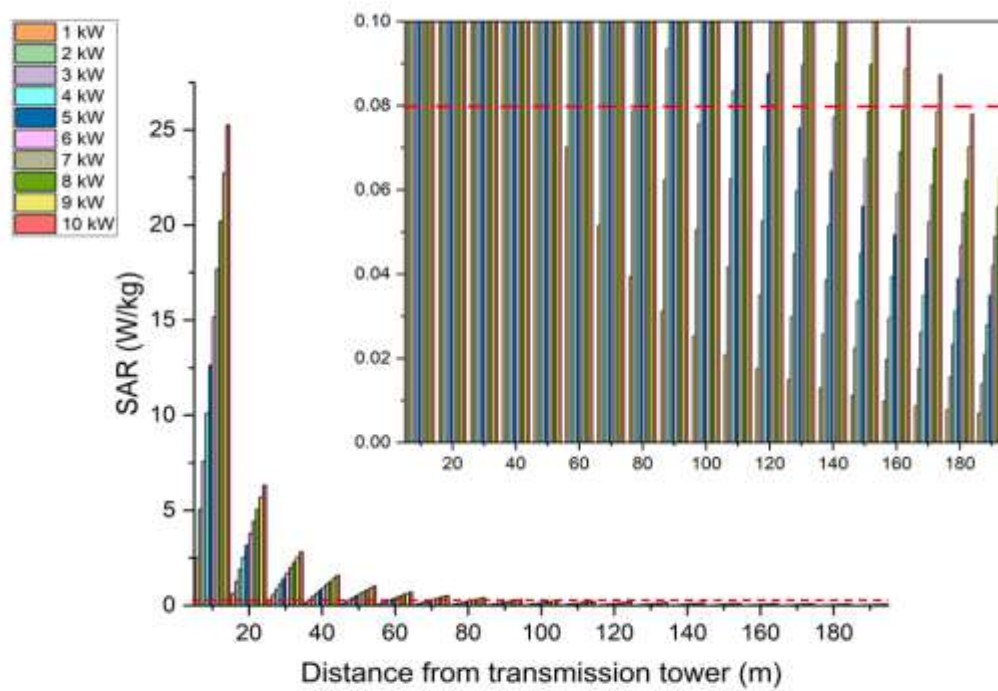
1(b)

Figure 1(a) and 1(b): Variation of SAR in human body at 3300 MHz frequency with variation of power (W)

(a) 50 W- 900 W (b) 1 kW- 10 kW

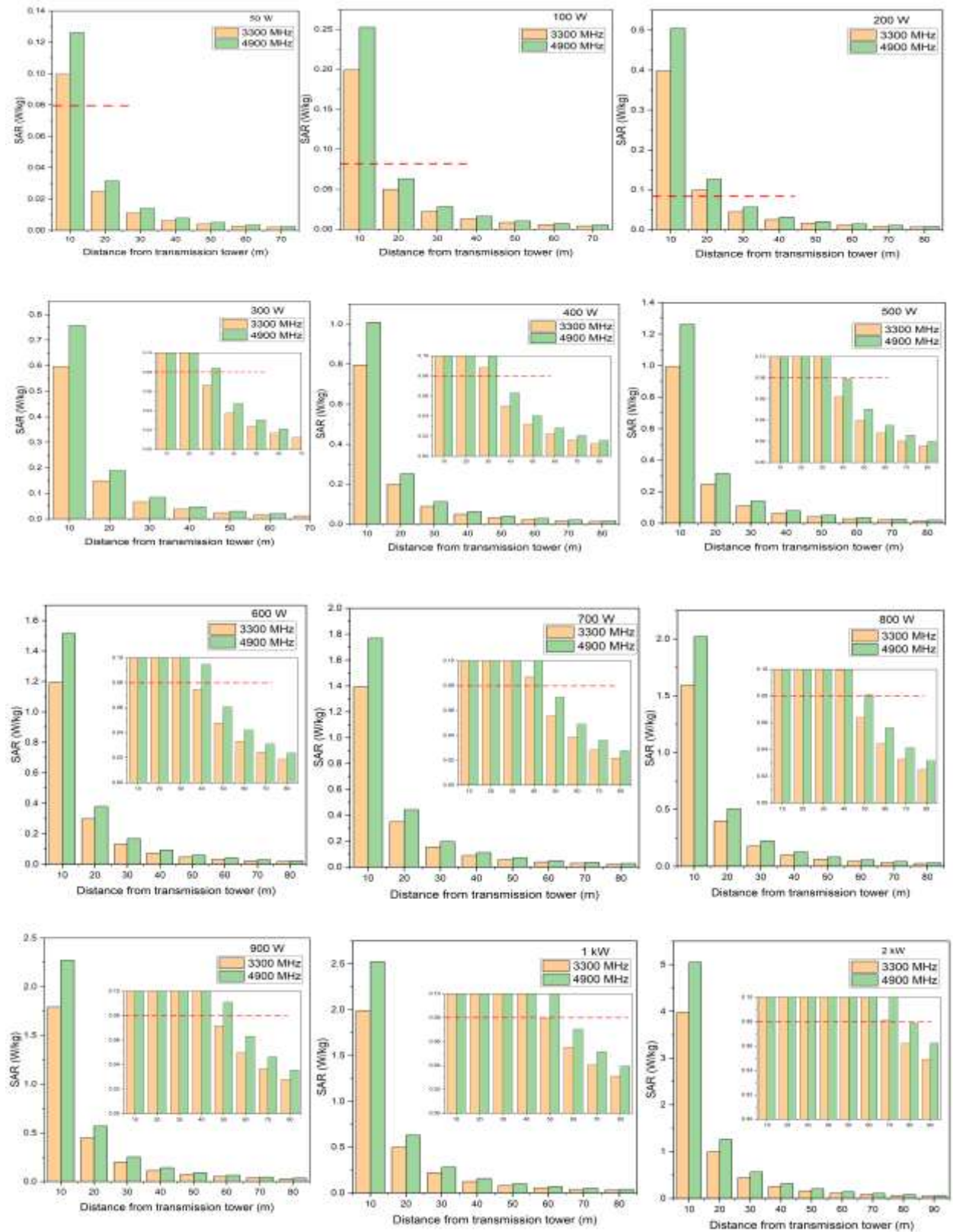


2(a)



2(b)

Figure 2(a) and 2(b): Variation of SAR in human body at 4900 MHz frequency with variation of power (W)
 (a) 50 W- 900 W (b) 1 kW- 10 kW



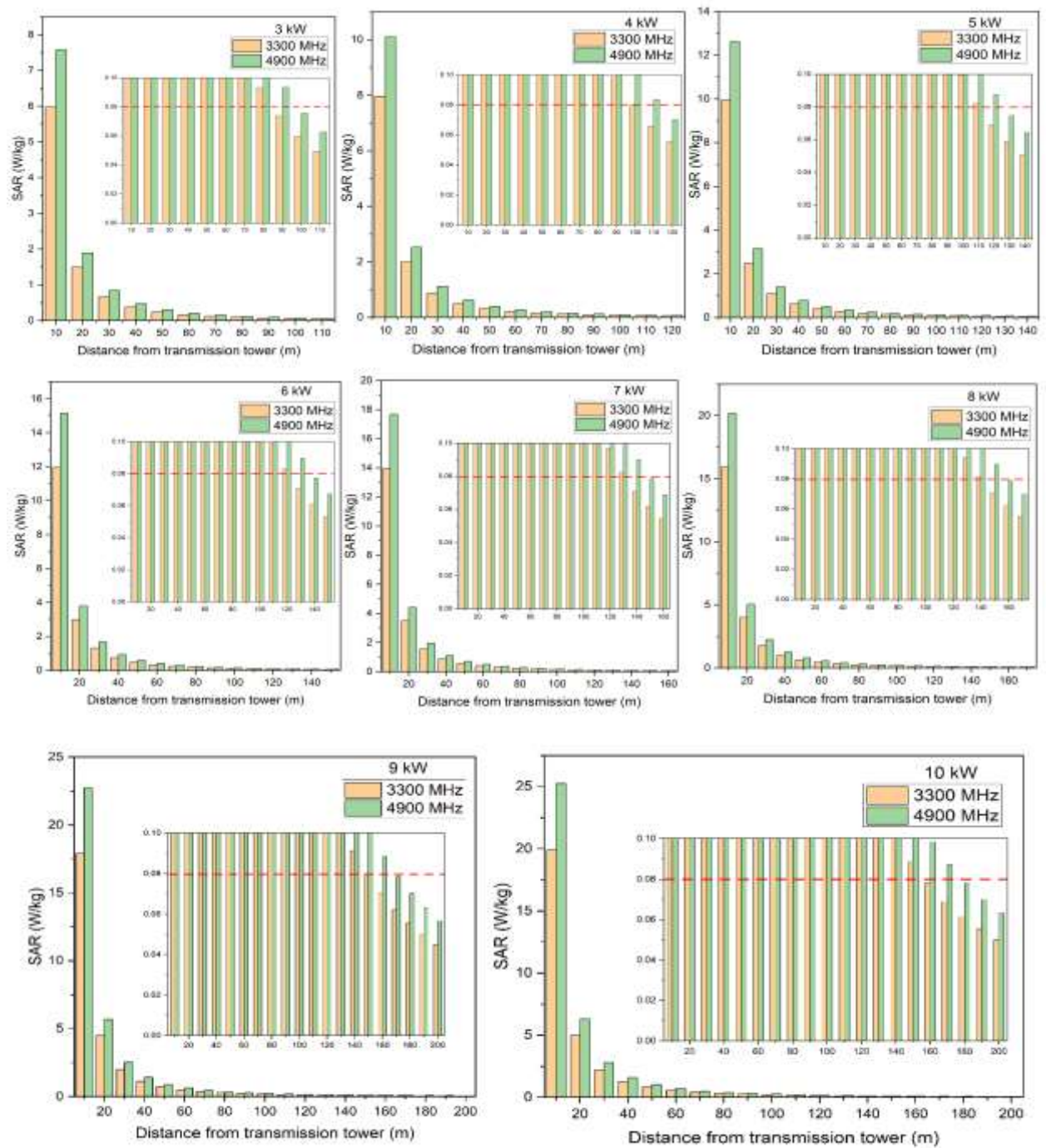


Figure3: Variation of SAR in human body at two different frequencies with power (W)

s. n. o.	Distance from transmission tower (m)	Variation of SAR in human body at different power P (W)									
		50 W	100 W	200 W	300 W	400 W	500 W	600 W	700 W	800 W	900 W
1	10	0.099552491	0.199104981	0.398209963	0.597314944	0.796419926	0.995524907	1.194629888	1.39373487	1.592839851	1.791944833
2	20	0.024888123	0.049776245	0.099552491	0.149328736	0.199104981	0.248881227	0.298657472	0.348433717	0.398209963	0.447986208
3	30	0.011061388	0.022122776	0.044245551	0.066368327	0.088491103	0.110613879	0.132736654	0.15485943	0.176982206	0.199104981
4	40	0.006222031	0.012444061	0.024888123	0.037332184	0.049776245	0.062220307	0.074664368	0.087108429	0.099552491	0.111996552
5	50	0.0039821	0.007964199	0.015928399	0.023892598	0.031856797	0.039820996	0.047785196	0.055749395	0.063713594	0.071677793
6	60	0.002765347	0.005530694	0.011061388	0.016592082	0.022122776	0.02765347	0.033184164	0.038714857	0.044245551	0.049776245
7	70	0.002031683	0.004063367	0.008126734	0.012190101	0.016253468	0.020316835	0.024380202	0.028443569	0.032506936	0.036570303
8	80	0.001555508	0.003111015	0.006222031	0.009333046	0.012444061	0.015555077	0.018666092	0.021777107	0.024888123	0.027999138
9	90	0.001229043	0.002458086	0.004916172	0.007374259	0.009832345	0.012290431	0.014748517	0.017206603	0.01966469	0.022122776
10	100	0.000995525	0.00199105	0.0039821	0.005973149	0.007964199	0.009955249	0.011946299	0.013937349	0.015928399	0.017919448
11	110	0.000822748	0.001645496	0.003290991	0.004936487	0.006581983	0.008227479	0.009872974	0.01151847	0.013163966	0.014809461
12	120	0.000691337	0.001382673	0.002765347	0.00414802	0.005530694	0.006913367	0.008296041	0.009678714	0.011061388	0.012444061
13	130	0.000589068	0.001178136	0.002356272	0.003534408	0.004712544	0.00589068	0.007068816	0.008246952	0.009425088	0.010603224
14	140	0.000507921	0.001015842	0.002031683	0.003047525	0.004063367	0.005079209	0.00609505	0.007110892	0.008126734	0.009142576
15	150	0.000442456	0.000884911	0.001769822	0.002654733	0.003539644	0.004424555	0.005309466	0.006194377	0.007079288	0.007964199

1 6	160	0.0003 88877	0.0007 77754	0.0015 55508	0.0023 33262	0.0031 11015	0.0038 88769	0.0046 66523	0.0054 44277	0.0062 22031	0.0069 99785
1 7	170	0.0003 44472	0.0006 88945	0.0013 77889	0.0020 66834	0.0027 55778	0.0034 44723	0.0041 33667	0.0048 22612	0.0055 11557	0.0062 00501
1 8	180	0.0003 07261	0.0006 14522	0.0012 29043	0.0018 43565	0.0024 58086	0.0030 72608	0.0036 87129	0.0043 01651	0.0049 16172	0.0055 30694
1 9	190	0.0002 75769	0.0005 51537	0.0011 03075	0.0016 54612	0.0022 06149	0.0027 57687	0.0033 09224	0.0038 60761	0.0044 12299	0.0049 63836
2 0	200	0.0002 48881	0.0004 97762	0.0009 95525	0.0014 93287	0.0019 9105	0.0024 88812	0.0029 86575	0.0034 84337	0.0039 821	0.0044 79862

Table 1(a): Variation of SAR in human body at 3300 MHz frequency with different power (50W – 900W)

s. n o.	Dista nce from trans missi on tower (m)	Variation of SAR in human body at different power P (W)									
		1 kW	2 kW	3 kW	4 kW	5 kW	6 kW	7 kW	8 kW	9 kW	10 kW
1	10	1.991 04981 4	3.982 09962 8	5.973 14944 2	3.982 09962 8	9.955 24907	11.94 62988 8	13.93 73487	15.92 83985 1	17.91 94483 3	19.91 04981 4
2	20	0.497 76245 4	0.995 52490 7	1.493 28736 1	0.995 52490 7	2.488 81226 8	2.986 57472 1	3.484 33717 5	3.982 09962 8	4.479 86208 2	4.977 62453 5
3	30	0.221 22775 7	0.442 45551 4	0.663 68327 1	0.442 45551 4	1.106 13878 6	1.327 36654 3	1.548 5943	1.769 82205 7	1.991 04981 4	2.212 27757 1
4	40	0.124 44061 3	0.248 88122 7	0.373 32184	0.248 88122 7	0.622 20306 7	0.746 64368	0.871 08429 4	0.995 52490 7	1.119 96552	1.244 40613 4
5	50	0.079 64199 3	0.159 28398 5	0.238 92597 8	0.159 28398 5	0.398 20996 3	0.477 85195 5	0.557 49394 8	0.637 13594	0.716 77793 3	0.796 41992 6
6	60	0.0553 06939	0.110 61387 9	0.165 92081 8	0.110 61387 9	0.276 53469 6	0.331 84163 6	0.387 14857 5	0.442 45551 4	0.497 76245 4	0.553 06939 3
7	70	0.0406 3367	0.081 26733 9	0.121 90100 9	0.081 26733 9	0.203 16834 8	0.243 80201 8	0.284 43568 8	0.325 06935 7	0.365 70302 7	0.406 33669 7

8	80	0.0311 10153	0.0622 20307	0.093 33046	0.0622 20307	0.155 55076 7	0.186 66092	0.217 77107 3	0.248 88122 7	0.279 99138	0.311 10153 3
9	90	0.0245 80862	0.0491 61724	0.0737 42586	0.0491 61724	0.122 90431	0.147 48517 1	0.172 06603 3	0.196 64689 5	0.221 22775 7	0.245 80861 9
1 0	100	0.0199 10498	0.0398 20996	0.0597 31494	0.0398 20996	0.099 55249 1	0.119 46298 9	0.139 37348 7	0.159 28398 5	0.179 19448 3	0.199 10498 1
1 1	110	0.0164 54957	0.0329 09914	0.0493 64871	0.0329 09914	0.082 27478 6	0.098 72974 3	0.115 1847	0.131 63965 7	0.148 09461 4	0.164 54957 1
1 2	120	0.0138 26735	0.0276 5347	0.0414 80204	0.0276 5347	0.0691 33674	0.082 96040 9	0.096 78714 4	0.110 61387 9	0.124 44061 3	0.138 26734 8
1 3	130	0.0117 8136	0.0235 6272	0.0353 4408	0.0235 6272	0.0589 06799	0.0706 88159	0.082 46951 9	0.094 25087 9	0.106 03223 9	0.117 81359 8
1 4	140	0.0101 58417	0.0203 16835	0.0304 75252	0.0203 16835	0.0507 92087	0.0609 50505	0.0711 08922	0.081 26733 9	0.091 42575 7	0.101 58417 4
1 5	150	0.0088 4911	0.0176 98221	0.0265 47331	0.0176 98221	0.0442 45551	0.0530 94662	0.0619 43772	0.0707 92882	0.079 64199 3	0.088 49110 3
1 6	160	0.0077 77538	0.0155 55077	0.0233 32615	0.0155 55077	0.0388 87692	0.0466 6523	0.0544 42768	0.0622 20307	0.0699 97845	0.077 77538 3
1 7	170	0.0068 89446	0.0137 78891	0.0206 68337	0.0137 78891	0.0344 47229	0.0413 36674	0.0482 2612	0.0551 15566	0.0620 05012	0.0688 94457
1 8	180	0.0061 45215	0.0122 90431	0.0184 35646	0.0122 90431	0.0307 26077	0.0368 71293	0.0430 16508	0.0491 61724	0.0553 06939	0.0614 52155
1 9	190	0.0055 15373	0.0110 30747	0.0165 4612	0.0110 30747	0.0275 76867	0.0330 92241	0.0386 07614	0.0441 22988	0.0496 38361	0.0551 53734
2 0	200	0.0049 77625	0.0099 55249	0.0149 32874	0.0099 55249	0.0248 88123	0.0298 65747	0.0348 43372	0.0398 20996	0.0447 98621	0.0497 76245

Table 1(b): Variation of SAR in human body at 3300 MHz frequency with different power (1 kW – 10 kW)

s. n. o.	Distance from transmission tower (m)	Variation of SAR in human body at different power P (W)									
		50 W	100 W	200 W	300 W	400 W	500 W	600 W	700 W	800 W	900 W
1	10	0.126251558	0.252503116	0.505006233	0.757509349	1.010012465	1.262515582	1.515018698	1.767521815	2.020024931	2.272528047
2	20	0.03156289	0.063125779	0.126251558	0.189377337	0.252503116	0.315628895	0.378754675	0.441880454	0.505006233	0.568132012
3	30	0.014027951	0.028055902	0.056111804	0.084167705	0.112223607	0.140279509	0.168335411	0.196391313	0.224447215	0.252503116
4	40	0.007890722	0.015781445	0.03156289	0.047344334	0.063125779	0.078907224	0.094688669	0.110470113	0.126251558	0.142033003
5	50	0.005050062	0.010100125	0.020200249	0.030300374	0.040400499	0.050500623	0.060600748	0.070700873	0.080800997	0.090901122
6	60	0.003506988	0.007013975	0.014027951	0.021041926	0.028055902	0.035069877	0.042083853	0.049097828	0.056111804	0.063125779
7	70	0.002576562	0.005153125	0.01030625	0.015459374	0.020612499	0.025765624	0.030918749	0.036071874	0.041224999	0.046378123
8	80	0.001972681	0.003945361	0.007890722	0.011836084	0.015781445	0.019726806	0.023672167	0.027617528	0.03156289	0.035508251
9	90	0.001558661	0.003117322	0.006234645	0.009351967	0.01246929	0.015586612	0.018703935	0.021821257	0.024938579	0.028055902
10	100	0.001262516	0.002525031	0.005050062	0.007575093	0.010100125	0.012625156	0.015150187	0.017675218	0.020200249	0.02272528
11	110	0.001043401	0.002086803	0.004173605	0.006260408	0.00834721	0.010434013	0.012520816	0.014607618	0.016694421	0.018781224
12	120	0.000876747	0.001753494	0.003506988	0.005260482	0.007013975	0.008767469	0.010520963	0.012274457	0.014027951	0.015781445
13	130	0.000747051	0.001494101	0.002988203	0.004482304	0.005976405	0.007470506	0.008964608	0.010458709	0.01195281	0.013446912
14	140	0.000644141	0.001288281	0.002576562	0.003864844	0.005153125	0.006441406	0.007729687	0.009017968	0.01030625	0.011594531
15	150	0.000561118	0.001122236	0.002244472	0.003366708	0.004488944	0.00561118	0.006733416	0.007855653	0.008977889	0.010100125
16	160	0.00049317	0.00098634	0.001972681	0.002959021	0.003945361	0.004931701	0.005918042	0.006904382	0.007890722	0.008877063
17	170	0.000436857	0.000873713	0.001747426	0.0026114	0.003494853	0.004368566	0.005242279	0.006115992	0.006989706	0.007863419
18	180	0.000389665	0.000779331	0.001558661	0.002337992	0.00317322	0.0040396653	0.0049175984	0.0057955314	0.0066734645	0.0075513975
19	190	0.000349727	0.000699455	0.001398909	0.002098364	0.002797818	0.003497273	0.004196728	0.004896182	0.005595637	0.006295092
20	200	0.000315629	0.000631258	0.001262516	0.001893773	0.002525031	0.003156289	0.003787547	0.004418805	0.005050062	0.00568132

Table 2(a): Variation of SAR in human body at 4900 MHz frequency with different power (50W – 900W)

s. n o.	Distance from trans mission tower (m)	Variation of SAR in human body at different power P (W)									
		1 kW	2 kW	3 kW	4 kW	5 kW	6 kW	7 kW	8 kW	9 kW	10 kW
1	10	2.5250 31164	5.0500 62327	7.5750 93491	10.100 12465	12.625 15582	15.150 18698	17.675 21815	20.200 24931	22.725 28047	25.250 31164
2	20	0.6312 57791	1.2625 15582	1.8937 73373	2.5250 31164	3.1562 88955	3.7875 46746	4.4188 04536	5.0500 62327	5.6813 20118	6.3125 77909
3	30	0.2805 59018	0.5611 18036	0.8416 77055	1.1222 36073	1.4027 95091	1.6833 54109	1.9639 13127	2.2444 72145	2.5250 31164	2.8055 90182
4	40	0.1578 14448	0.3156 28895	0.4734 43343	0.6312 57791	0.7890 72239	0.9468 86686	1.1047 01134	1.2625 15582	1.4203 3003	1.5781 44477
5	50	0.1010 01247	0.2020 02493	0.3030 0374	0.4040 04986	0.5050 06233	0.6060 07479	0.7070 08726	0.8080 09972	0.9090 11219	1.0100 12465
6	60	0.0701 39755	0.1402 79509	0.2104 19264	0.2805 59018	0.3506 98773	0.4208 38527	0.4909 78282	0.5611 18036	0.6312 57791	0.7013 97545
7	70	0.0515 31248	0.1030 62496	0.1545 93745	0.2061 24993	0.2576 56241	0.3091 87489	0.3607 18738	0.4122 49986	0.4637 81234	0.5153 12482
8	80	0.0394 53612	0.0789 07224	0.1183 60836	0.1578 14448	0.1972 6806	0.2367 21672	0.2761 75284	0.3156 28895	0.3550 82507	0.3945 36119
9	90	0.0311 73224	0.0623 46448	0.0935 19673	0.1246 92897	0.1558 66121	0.1870 39345	0.2182 1257	0.2493 85794	0.2805 59018	0.3117 32242
10	100	0.0252 50312	0.0505 00623	0.0757 50935	0.1010 01247	0.1262 51558	0.1515 0187	0.1767 52181	0.2020 02493	0.2272 52805	0.2525 03116
11	110	0.0208 68026	0.0417 36052	0.0626 04078	0.0834 72105	0.1043 40131	0.1252 08157	0.1460 76183	0.1669 44209	0.1878 12235	0.2086 80261
12	120	0.0175 34939	0.0350 69877	0.0526 04816	0.0701 39755	0.0876 74693	0.1052 09632	0.1227 4457	0.1402 79509	0.1578 14448	0.1753 49386
13	130	0.0149 41013	0.0298 82026	0.0448 23038	0.0597 64051	0.0747 05064	0.0896 46077	0.1045 8709	0.1195 28102	0.1344 69115	0.1494 10128
14	140	0.0128 82812	0.0257 65624	0.0386 48436	0.0515 31248	0.0644 1406	0.0772 96872	0.0901 79684	0.1030 62496	0.1159 45309	0.1288 28121
15	150	0.0112 22361	0.0224 44721	0.0336 67082	0.0448 89443	0.0561 11804	0.0673 34164	0.0785 56525	0.0897 78886	0.1010 01247	0.1122 23607
16	160	0.0098 63403	0.0197 26806	0.0295 90209	0.0394 53612	0.0493 17015	0.0591 80418	0.0690 43821	0.0789 07224	0.0887 70627	0.0986 3403
17	170	0.0087 37132	0.0174 74264	0.0262 11396	0.0349 48528	0.0436 8566	0.0524 22792	0.0611 59924	0.0698 97056	0.0786 34188	0.0873 71321
18	180	0.0077 93306	0.0155 86612	0.0233 79918	0.0311 73224	0.0389 6653	0.0467 59836	0.0545 53142	0.0623 46448	0.0701 39755	0.0779 33061
19	190	0.0069 94546	0.0139 89092	0.0209 83638	0.0279 78185	0.0349 72731	0.0419 67277	0.0489 61823	0.0559 56369	0.0629 50915	0.0699 45462
20	200	0.0063 12578	0.0126 25156	0.0189 37734	0.0252 50312	0.0315 6289	0.0378 75467	0.0441 88045	0.0505 00623	0.0568 13201	0.0631 25779

Table 2(a): Variation of SAR in human body at 4900 MHz frequency with different power (1 kW – 10 kW)

V. CONCLUSION

On the basis of the above calculations, we can state that electromagnetic waves are harmful for the human body at various distances from transmission towers. Harmfulness increases at shorter distances and higher frequencies. We can also state that on increasing transmission power from the tower and working frequency, the harmfulness of electromagnetic radiation to human body also increases. It clear that the higher generation of transmission is sure to be more harmful than the earlier ones. This is the reason for worldwide opposition from scientific community against 5G & 6G communication system. As the deployment of 5G network continues, it is imperative that we remain vigilant in evaluating the potential risks and benefits, ensure that the drive for innovation does not come at the cost of public well-being.

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Conflict of interest

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