5th Generation (5G) Wireless Communications Fact Sheet

On July 14, 2016 the Federal Communications Commission allocated a high-frequency spectrum for 5G communications utilizing millimeter waves (mmW), the next phase in wireless cellular technology. But critical questions about the safety of this technology remain.

Thousands of published studies have established indisputable evidence of harmful health effects from exposure to microwave or radio-frequency radiation.

5G technology will require a dense network of millions of RF antennas, deployed in neighborhoods in towns and cities across the country, further exposing Americans to radio-frequency radiation in their homes, schools and businesses.

5G transmitters on residential poles in California

Concurrent with the rollout, new laws are being introduced in state legislatures across the country that would block the rights of local governments to control the installation of 5G antennas in public "rights of way." This unprecedented appropriation of local regulatory control prohibits local authorities from considering health, safety, aesthetic or environmental issues related to 5G technology.

Additional Facts about 5G:

- **5G mobile networks/wireless systems** are designed to deliver even faster internet speeds and expand the capacity of "smart devices" and machine-to-machine communications – the "Internet of Things" (IOT). It will be capable of transmitting large amounts of data over short distances.

- **5G wireless networks will utilize millimeter waves (mmWaves).** Compared with current cellular and WiFi networks which rely on microwaves that employ frequencies up to 6 gigahertz (GHz), 5G will use millimeter and sub-millimeter waves in higher frequency ranges (between 30 GHz and 300 GHz).

- **5G antennas will be placed on utility poles, lamp posts, houses, and commercial buildings.** mmWaves have short wavelengths, making it difficult for them to travel through buildings or other obstacles, including foliage on trees and even rain. 5G technology will require many closely spaced antennas for optimum functionality.

- **Exposure to all types of wireless radiation is associated with cancer and other health effects.** The World Health Organization has classified wireless radiation as a Group 2B "possible carcinogen," and the National Toxicology Program of the National Institutes of Health corroborated this finding. Studies have also found that normal exposures to radio frequency radiation can cause disruption of normal brain development in fetuses and learning disabilities, heart abnormalities and electro-hypersensitivity. Populations especially at risk from this type of radiation include pregnant women, children, those with implanted medical devices, electromagnetically sensitive individuals and the elderly.

Photo credit: Scientists for Wired Technology

- **mmWaves have unique health impacts on the human body.** Sweat ducts within our skin, the largest organ in the human body, act as antennae when in contact with mmWaves. The waves penetrate 1 to 2 millimeters of human skin tissue and are also absorbed by the surface layers of the eye's cornea.

- **Plants and animals are also harmed by wireless radiation.** Studies have found that electromagnetic radiation from mobile phone cell sites damages trees, and several studies have clearly demonstrated that radio-frequency radiation changes the makeup and structure of plants. Many research analyses also cite wireless technology as a contributing factor in the decline of bird, frog, bat, and honeybee populations.

- **mmWaves could make bacteria resistant to antibiotics.** One study analyzing mmWave interaction with bacteria found that the waves can cause changes in bacteria's sensitivity to different biologically active chemicals, such as antibiotics. This study suggests that mmWaves might create antibiotic resistance in bacteria, creating concern in the medical community.

- **The FCC is pushing for rapid implementation of 5G without considering its potential impacts on public health.** The U. S. government has failed to complete an analysis of the health effects of 5G and has yet to update its exposure standards to wireless radiation which were established back in the 1990s. The outdated FCC safety standard considers only thermal (heat) effects, not biological effects, which have been well established.

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