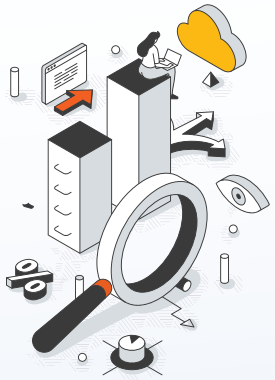
THE STUDY

Adult subjects were exposed to a series of counter-balanced, randomised, and double-blind conditions that mimicked emissions from 5G base stations to study the changes in **cognitive functions, brainwaves, well-being and physiological parameters** before, during or after the exposure (including sham*).

WHAT ARE WE LOOKING AT?



FOUR (4) MAIN FEATURES OF COGNITIVE PERFORMANCE

- Motor control (cognitive flexibility)
- Attention
- Memory
- Episodic secondary memory

ELECTROENCEPHALOGRAPHY (EEG) / BRAINWAVE

- Increase / decrease of alpha brainwaves (8 - 12 Hz)

PHYSIOLOGICAL PARAMETERS

- Heart rate (normal range: 60 - 100 bpm)
- Blood pressure (normal range: < 120/80 mmHg)
- Body temperature (normal range: 36.1 - 37.5°C)

WELL-BEING

- Responses associated to 23 health symptoms such as headache, dizziness, fatigue, nervousness and feeling of pressure

EMF PERCEPTION

- Ability of electromagnetic hypersensitive (sensitive) individuals to detect RF-EMF presence correctly

DO YOU KNOW

A double-blind condition is a randomised procedure where both the experimenter and the subject are unaware on the exposure they are sitting through during the study. This type of study is done to avoid placebo effects and is less likely biased.

Note: *Sham exposure means the subject went through the tests in the absence of actual radiation.

TEST SUBJECT

60 ADULTS RECRUITED

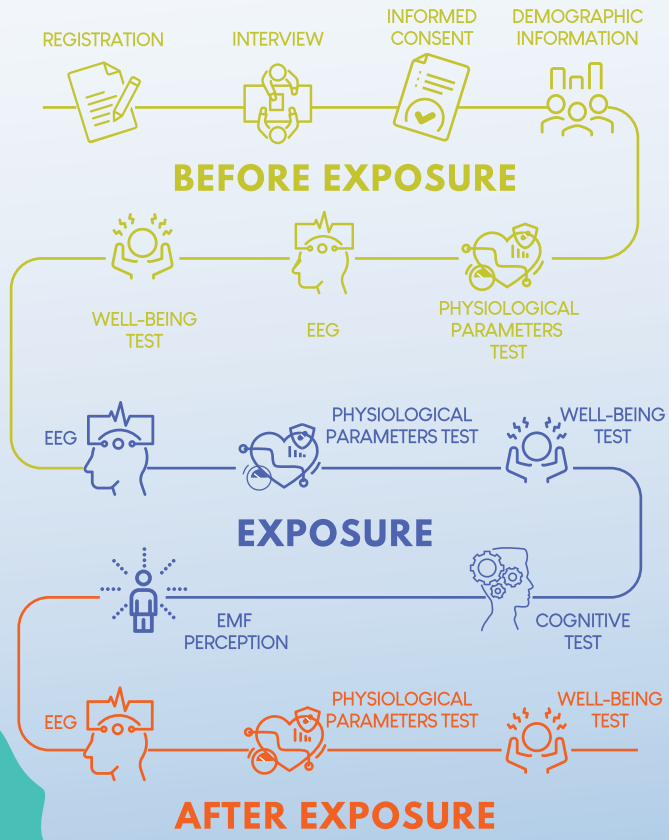
These subjects are carefully chosen to prevent bias and eliminate pre-existing conditions.

AGE CATEGORIES 18 YEARS OLD – 41 YEARS OLD

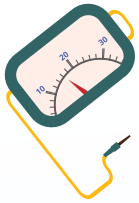
30 SENSITIVE

30 NORMAL

THE RESEARCH METHODOLOGY



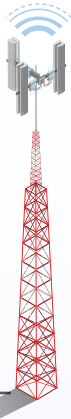
TEST SETUP



EXPOSURE TO 5G BASE STATION SIGNALS

700 MHz **3.5 GHz** **28 GHz**

PLUS ONE SHAM* SIGNAL
IN A SHIELDED ROOM WITH
AT LEAST 3 DAYS INTERVALS FOR EACH EXPOSURE SESSION



THE RESULTS

EMF PERCEPTION

Sensitive adults did not detect signals, meaning the 5G frequency range is at a safe level and did not trigger any types of dermatological, neurasthenic and vegetative symptoms.

Emission from 5G base station antennas did not influence the cognitive functions of Normal and Sensitive subjects.

COGNITIVE TEST

WELL-BEING TEST

Sensitive and Normal adults did not feel sick, dizzy or other well-being symptoms when they were exposed to signals.

No major influence to brainwaves of both Sensitive and Normal group samples.

EEG READING

PHYSIOLOGICAL PARAMETERS

Body temperature, blood pressure and heart rates remained unchanged even after exposure to all signals.

THE CONCLUSION

There is no evidence of significant effects on Malaysian adults regarding EMF perception, cognitive performance, well-being, EEG nor physiological parameters from short-term radiation exposure emitted from the 5G base station antenna signals.

5G

UNDERSTANDING OF 5G TECHNOLOGY

The 5th generation (5G) of mobile technology will be able to support many more terminals (device density up to 1 mil per square km) with much higher data rates (peak rate up to 20 Gbps), deliver extremely low latency (no more than 1 ms) and very high reliability.

5G will ensure high Quality of Experience for users and enable highly reliable mass communication between devices.

3 TYPES OF 5G SPECTRUM BANDS

LOW-BAND

BELOW 1 GHz

MID-BAND

BETWEEN 1 GHz – 6 GHz

HIGH-BAND

ABOVE 24 GHz

(ALSO KNOWN AS MILLIMETRE WAVE)

EXPOSURE LEVEL FROM 5G

"Currently, exposure from 5G infrastructures at around 3.5 GHz is similar to that from existing mobile phone base stations. With the use of multiple beams from 5G antennas, exposure could be more variable as a function of location of the users and their usage. Given that the 5G technology is currently at an early stage of deployment, the extent of any change in exposure to radiofrequency fields is still under investigation." – World Health Organization (WHO)

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has released new guidelines in 2020 for the protection of humans exposed to radiofrequency electromagnetic fields. The guidelines cover the upcoming 5G technologies, as well as AM and DAB radio, WiFi, Bluetooth and the currently used 3G / 4G mobile phones.

MCMC

For more information visit:

rfemf.mcmc.gov.my

5G BASE STATION
EXPOSURE TO THE PUBLIC'S HEALTH

THE STUDY ON EFFECTS OF SHORT-TERM 5G BASE STATION SIGNAL EXPOSURE ON COGNITIVE PERFORMANCE, WELL-BEING, PHYSIOLOGICAL PARAMETERS AND ELECTROENCEPHALOGRAPHY (EEG) OF MALAYSIAN ADULTS

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