COMMENTS SUBMITTED TO THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Docket No. HHS-OASH-2026-0397

Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure

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I appreciate the opportunity to provide comments regarding radiofrequency radiation (RF) and other non-ionizing electromagnetic field (EMF) exposures and potential impacts on human health.

As a member of the public, I support HHS's effort to evaluate the current state of scientific evidence regarding RF/EMF exposure, identify research gaps, assess vulnerable populations, and develop evidence-based recommendations to better inform policymakers, healthcare professionals, educators, families, and communities.

The widespread adoption of wireless technologies has transformed modern life. However, the scientific understanding of possible long-term biological effects has not advanced at the same pace as the growth in exposure. Given the increasing ubiquity of wireless devices and infrastructure, I believe a comprehensive, transparent, and independent review of the evidence is warranted. Evidence needs to be publicly available, even when found to be inconvenient truths, particularly when evidence cannot be published when it does not a private publications scientific or medical agenda as they appear fearful of the conflict or fallout that may arise.

RESPONSE TO FCC'S 2019 FINDING THAT THE RECORD DID NOT JUSTIFY CHANGING ITS 1996 RULES

The FCC concluded in 2019 that the record before the agency did not justify changes to its RF exposure rules.

I respectfully submit that the body of scientific evidence available today raises sufficient questions to justify renewed investigation by public health agencies.

I do not contend that any single study establishes definitive proof of harm. However, the accumulated evidence regarding biological effects occurring at exposure levels below existing FCC limits warrants continued examination rather than dismissal.

Several research areas have repeatedly appeared in the scientific literature, including:

- Oxidative stress and reactive oxygen species generation
- DNA damage and genetic effects
- Neurological and neurobehavioral changes
- Reproductive effects
- Reduced sperm quality and motility
- Sleep disturbances
- Cardiovascular effects
- Potential developmental impacts

While uncertainties remain, the persistence of these findings across multiple studies suggests that additional investigation is justified.

From a public health perspective, the appropriate question is not whether every scientific uncertainty has been resolved, but whether sufficient evidence exists to identify priority areas for further research and risk assessment.

CHILDREN AND OTHER POTENTIALLY VULNERABLE POPULATIONS

Children deserve particular attention in future RF/EMF research.

Current generations are exposed to wireless technologies beginning in early life through:

- Smartphones
- Tablets
- Wireless educational technologies
- Wi-Fi networks
- Wearable devices
- Smart-home technologies

These exposure patterns differ substantially from those experienced by previous generations.

Research priorities should include:

- Prenatal exposure
- Childhood neurodevelopment
- Adolescent development

- Lifetime cumulative exposure
- Reproductive outcomes
- Potential interactions with other environmental stressors

Additional study should also address potentially vulnerable populations including pregnant women, individuals with chronic illnesses, and persons reporting electromagnetic hypersensitivity symptoms.

LONG-TERM EXPOSURE AND CUMULATIVE RISK

One of the most significant limitations of the existing scientific literature is the relative scarcity of long-term data reflecting real-world exposure conditions.

Most individuals today are exposed simultaneously to multiple RF-emitting sources throughout the day, including:

- Cellular networks
- Wi-Fi systems
- Bluetooth devices
- Wearable electronics
- Smart appliances
- Wireless infrastructure

Research should examine cumulative and lifelong exposure patterns rather than focusing exclusively on isolated exposure sources.

Longitudinal studies assessing health outcomes over extended periods may be particularly valuable in addressing remaining scientific uncertainties.

NATIONAL TOXICOLOGY PROGRAM FINDINGS

The findings of the National Toxicology Program represent one of the most comprehensive government-funded investigations of RF radiation conducted to date.

Whether or not those findings ultimately justify regulatory changes, they provide evidence that warrants careful consideration by public health agencies.

Future research should seek to:

- Replicate important findings
- Clarify mechanisms of action

- Evaluate relevance to human exposure scenarios
- Assess dose-response relationships
- Identify susceptible populations

Continued investigation of these questions would help reduce uncertainty and strengthen future public health recommendations.

REPRODUCTIVE HEALTH AND FERTILITY

Growing public concern exists regarding declining fertility rates, sperm quality, and reproductive health outcomes.

Several studies have suggested associations between RF/EMF exposure and:

- Reduced sperm motility
- Changes in sperm morphology
- Oxidative stress affecting reproductive tissues
- Potential impacts on fertility

Because reproduction and fertility are fundamental public health concerns, this area warrants priority investigation.

Future research should focus on identifying whether exposure-related effects are reproducible, biologically plausible, and clinically meaningful.

ENVIRONMENTAL AND WILDLIFE CONSIDERATIONS

Environmental impacts remain understudied.

Research priorities should include possible effects on:

- Pollinators
- Birds
- Insects
- Mammalian wildlife
- Vegetation
- Ecosystem health

The available evidence remains incomplete, and additional independent field studies may be necessary to better understand environmental exposure patterns and ecological outcomes.

HHS can play an important role by identifying environmental research gaps and supporting multidisciplinary investigation.

RESEARCH GAPS AND PRIORITIES

I encourage HHS to prioritize research in the following areas:

1. Children's health and developmental outcomes.
2. Prenatal and early-life exposures.
3. Reproductive health and fertility.
4. Long-term cumulative exposure.
5. Neurological and cognitive outcomes.
6. Cardiovascular effects.
7. Mechanisms underlying oxidative stress and DNA damage.
8. Environmental and wildlife impacts.
9. Improved exposure assessment and dosimetry.
10. Replication of significant prior findings.

Particular emphasis should be placed on independent research free from conflicts of interest and conducted using transparent, reproducible methodologies.

POLICY CONSIDERATIONS

The goal of public health policy should be informed decision-making under conditions of scientific uncertainty.

It is not necessary to conclusively establish harm before identifying prudent research priorities or encouraging practical exposure-reduction measures.

HHS can serve an important role by:

- Promoting high-quality independent research.
- Communicating scientific uncertainty clearly.
- Identifying evidence gaps.
- Supporting transparency.
- Developing practical guidance for families, schools, and communities.
- Update RF radiation exposure limits based on a comprehensive review and risk analysis of scientific research to address long-term, cumulative exposures and non-thermal effects, with

risk-mitigation protections for children, pregnancy, and medically vulnerable populations. The approach should be risk mitigation.

- Direct federal agencies to commission the National Academies of Sciences, Engineering, and Medicine to review the health and environmental effects of non-ionizing electromagnetic fields, including RF and ELF exposures, and issue actionable policy recommendations, research priorities, monitoring, and protection of children, workers, and ecosystems.
- Direct the National Institute of Environmental Health Sciences (NIEHS) to conduct a comprehensive, transparent review of human, animal, and mechanistic evidence on the health effects of RF, ELF and other non-ionizing exposures, including chronic exposure and vulnerable populations. Prioritize evaluations of RF radiation and ELF magnetic fields for inclusion in the National Toxicology Program's Report on Carcinogens.
- Require premarket safety testing for health effects from chronic exposure for all new wireless technologies, and for proposed electrical grid infrastructure (such as high voltage 765 kv power lines) emissions, just as is required for drugs.
- Modernize cell phone and wireless device compliance tests to reflect real-world use, including direct body contact and simultaneous exposure from multiple devices.
- Restore independent federal research programs and coordinated interagency review of the scientific evidence. All activities and funding should be publicly reported.
- Establish routine robust post-market RF radiation compliance testing for all cell phones, RF emitting devices, cell towers, base stations etc., with all results publicly posted and meaningful enforcement.
- Create a national health and environmental surveillance system to document and investigate suspected adverse effects.
- Implement a nationwide RF and EMF exposure measuring and monitoring program prioritizing schools, workplaces, residential areas, and sensitive wildlife habitats with 24/7 monitoring. All measurements should be publicly posted with the ability to see time trends.
- Require clear RF radiation exposure labeling on all cell phones, Wi-Fi, Bluetooth and wireless devices, packaging, and at the point of sale, including applicable separation distances and practical instructions to reduce exposure.
- Launch a comprehensive public health educational campaign with clear straightforward guidance on reducing RF exposure and using wired alternatives. This should address not only cell phones, but also all RF-emitting devices.
- Create an occupational health program to ensure workplace protections, including exposure assessments for diverse workplace exposures, worker training, medical surveillance, and pregnancy-specific accommodations.
- Create a public registry of all wireless network infrastructure, (cell towers, 4G, 5G, etc) with antenna locations, RF measurements, compliance records, and complaints and agency responses publicly posted.
- Establish an easy-to-use public online platform and mapping tool that presents the RF measurements, location of wireless base stations, with associated permitting and compliance data.

- Mitigate RF and EMF exposures in schools and childcare settings, prioritize wired connections, and establish protective siting policies to ensure schools are not near RF or EMF emitting infrastructure.
- Prohibit cell towers and high-voltage power lines on or near schools.
- Develop wildlife-specific exposure limits and immediate policies to mitigate wildlife exposure and environmental exposures in ecologically sensitive areas.
- Incentivise technologies and research that eliminate and/or reduce exposure, including readily available Ethernet connections and other wired options.
- Ensure independent, transparent regulatory decisions, with safeguards against industry conflicts of interest.
- Ensure RF and EMF related complaints to the FCC or other agencies and the agency's response are publicly available.

Recommendations for Schools to Protect Children, Teachers, and Staff from the **Position Statement By The International Commission On The Biological Effects Of Electromagnetic Fields**

- Replace all Wi-Fi networks with hardwired, shielded Ethernet internet connections.
- Purchase laptops and tablets with Ethernet capability, and with easy steps to disable wireless antennas so that computers connect to the internet with Ethernet only.
- Require that all cell phones be powered off for the entire school day and stored in a Faraday box or other shielded storage to reduce unnecessary RF exposure and minimize classroom distractions.
- Require that all devices and technology equipment used in schools have wireless transmitters (intentional radiators) disabled, ensuring that no wireless radiation sources operate within school buildings.
- Provide wired telephones for personnel in all classrooms.
- Educate students, staff, and families on the risks of wireless and EMF exposure and how to reduce exposure.
- Minimize ELF exposures by ensuring adequate grounding, use of shielded cabling, twisted wiring, and devices with low ELF emissions.
- Ensure students are at a distance from electrical equipment and charging stations.
- Prohibit cell towers/base stations and other wireless emitting antennas on or near school property as is already the policy in some countries and U.S. school districts.[i]
- Prohibit high-voltage power lines and electrical substations on or near school property.
- School boards should maintain a team that can routinely conduct transparent, independent real-time EMF measurements (including body-worn *dosimeters*) in classrooms, playgrounds, and sports fields to ensure the lowest possible levels are maintained.
- Continuously mitigate as required to ensure the above principles are adhered to

Recommendations for Wildlife and the Environment from "Flora and fauna—How nonhuman species interact with natural and man-made EMF at ecosystem levels and public policy recommendations"

published in Frontiers in Public Health. Here are some of the key recommendations.Download the paper here.

- Recognize non-ionizing EMF as a biologically active pollutant in air, ground, and water, and designate airspace as habitat.
- Establish an EPA research program on RF biological and ecological impacts, including long-term exposure, cumulative risks, and interactions with other environmental stressors.
- Determine which ICRP protections for flora and fauna can apply to non-ionizing radiation.
- Ensure independent science guides federal safety standards protecting public health and the environment. Fund research to close wildlife data gaps and inform updated regulations.
- Establish wildlife exposure standards addressing chronic, low-level EMF exposure and avoiding or minimizing take of protected species. Model species-specific, whole-body and organ-specific resonance, with laboratory and field validation.
- Create a species- and frequency-specific exposure database.
- Create an environmental surveillance/reporting program to track wildlife behavior, reproduction, population trends, and effects on plants and trees in exposed areas.
- Amend migratory bird “take” protections to address known or suspected EMF impacts.
- Include wireless radiation effects in tower permitting and migratory bird rulemaking.
- Implement nationwide EMF monitoring, prioritizing parks, forests, refuges, wetlands, coastal ecosystems, migratory corridors, and wilderness areas.
- Establish NEPA-compliant procedures assessing cumulative RF and non-ionizing EMF impacts on wildlife, insects, and flora. Include emissions estimates and exposure-reduction design alternatives in environmental impact statements
- Document categorically excluded facilities and publish environmental assessments and RF compliance reports.
- Make wildlife protection and reducing EMF exposure a priority in technology and communications network design. Require independent RF spot checks before and after construction.
- Subject existing and proposed satellite systems to NEPA review.
- Fund at least one wildlife biologist position at FCC.
- Require premarket testing, including cost–benefit and cumulative effects analyses.
- Conduct robust environmental reviews that include EMF exposure before licensing and national deployment of new technologies.
- Establish accessible post-market reporting systems for ecological impacts.
- Establish formal interagency coordination, bioelectromagnetics expertise, and regular meetings.
- Establish species-specific habitat protections. Implement policies to reduce exposure. Direct antenna emissions away from foraging, nesting, and denning sites.Reduce ELF exposure through transmission corridor siting and wire configurations that reduce magnetic fields.Designate low- to no-EMF zones in critical habitats, wilderness areas, parks, forests, refuges, and other sensitive areas. Prohibit higher-frequency deployments that pose heightened risks to sensitive taxa in ecologically sensitive areas.

- Use barriers, antenna pattern modifications, and power line configurations to reduce wildlife exposure.
- Prioritize non-invasive non EMFemitting wildlife tracking and assess telemetry equipment for exposures and potential effects before use. Minimize telemetry emissions, transmission times, equipment burden, and the number of tagged animals.

CONCLUSION

The scientific literature concerning RF/EMF exposure continues to evolve. While significant uncertainties remain, there is sufficient evidence regarding potential biological effects, children's exposures, reproductive health, long-term cumulative exposure, and environmental concerns to justify continued investigation.

I encourage HHS to systematically evaluate the available evidence, identify critical research gaps, support independent scientific inquiry, and develop evidence-based recommendations that protect public health while remaining grounded in scientific rigor and transparency.

Thank you for the opportunity to submit these comments.

Respectfully submitted,

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