U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Office of the Assistant Secretary for Health

Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure, Docket No. HHS-OASH-2026-0397, 91 Fed. Reg. 59792

October 21, 2026

COMMENTS OF CTIA

CTIA,[1] an association representing the U.S. wireless communications industry and companies operating within the mobile ecosystem, respectfully submits these comments in response to the Request for Information ("RFI") on Electromagnetic Fields ("EMFs"), Radiofrequency ("RF") Radiation, and Wireless Radiation Exposure issued by the U.S. Department of Health and Human Services ("HHS" or the "Department").[2] CTIA's members have long prioritized consumer safety, and CTIA and its members have engaged constructively with federal and state regulators and health agencies for more than three decades on matters relating to RF exposure from wireless devices[3] and infrastructure. CTIA shares the Department's interest in ensuring that federal policy on RF exposure is grounded in the best available science and provides these comments to contribute to the continued development of a rigorous, science-based record to inform practical, evidence-based policy.

International and U.S. health and safety organizations agree that the overwhelming weight of peer-reviewed scientific evidence, based on decades of research, confirms that exposure to RF from wireless devices and equipment does not pose health risks to the public at levels permitted under current FCC standards. The Federal Communications Commission ("FCC") has for decades pursued a scientific approach to regulating RF exposure from FCC-authorized wireless devices and equipment.[4] In 1996, the FCC adopted its current RF exposure standards based on the comments of federal health and safety agencies, which generally supported the recommendations of the Institute of Electrical and Electronics Engineers ("IEEE"), the American National Standards Institute ("ANSI"), and the National Council on Radiation

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[1] CTIA – The Wireless Association® ("CTIA") (www.ctia.org) represents the U.S. wireless communications industry and the companies throughout the mobile ecosystem that enable Americans to lead a 21st century connected life. The association's members include wireless providers, device manufacturers, and suppliers, as well as apps and content companies. CTIA vigorously advocates at all levels of government for policies that foster continued wireless innovation and investment. CTIA represents a broad diversity of stakeholders, and the specific positions outlined in these comments may not reflect the views of all individual members. The association also coordinates the industry's voluntary best practices and hosts educational events that promote the wireless industry. CTIA was founded in 1984 and is based in Washington, D.C.

[2] *Request for Information on Electromagnetic Fields (EMFs), Radiofrequency (RF) Radiation, and Wireless Radiation Exposure*, 91 Fed. Reg. 59792 (Sep. 21, 2026) ("RFI").

[3] In this context, "wireless devices" refers to cell phones and other portable mobile communications equipment. This definition may include, for example, smartphones, feature phones, tablets, and wearables.

[4] See *Responsibility of the Federal Communications Commission to Consider Biological Effects of Radiofrequency Radiation When Authorizing the Use of Radiofrequency Devices, Potential Effects of a Reduction in the Allowable Level of Radiofrequency Radiation on FCC Authorized Communications Services and Equipment, Report and Order*, 100 F.C.C.2d 543, 544 ¶ 1 (1985) ("1985 FCC Order").

Protection and Measurements ("NCRP").[5] Those standards incorporated a 50-fold safety factor below the level at which adverse biological effects have been observed in laboratory animals.[6]

Since then, federal health agencies, international standard-setting organizations, and international health groups have continued to examine RF exposure from wireless devices and have concluded that exposure at or below current FCC limits does not cause adverse health effects. The U.S. Food and Drug Administration has determined that "[t]he weight of scientific evidence has not linked cell phone radio frequency radiation with any health problems."[7] The International Commission on Non-Ionizing Radiation Protection ("ICNIRP") has concluded that "RF EMF exposure below the thermal threshold is unlikely to be associated with adverse health effects."[8] The IEEE has reached the same conclusion,[9] as have numerous other expert bodies, as discussed further in response to Question 12 below. As CTIA previously explained in a letter to the White House's Make America Healthy Again ("MAHA") Commission, "a significant body of science and precedent demonstrates" that the suggestion that wireless devices cause adverse health effects is "without merit."[10]

HHS decisions must be grounded in peer-reviewed scientific evidence and established consensus from recognized expert bodies—not anecdotal claims, unverified reports, or self-reported symptoms. HHS's assessment of the evidence submitted in response to this RFI could influence how the federal government evaluates and communicates about emerging technologies and public health. As such, it must be based on the best scientific peer-reviewed evidence available. The RFI itself recognizes that the scientific literature on RFI "is extensive, technically complex, and not always easy for policymakers or public health stakeholders to interpret[,]" and asks commenters "to clearly distinguish established evidence from emerging findings and areas of uncertainty[.]"[11] Further, the RFI notes that HHS "supports transparent, science-informed decision-making."[12] Rigorous scientific research has been, and must remain, the touchstone of RF regulation in the United States, and federal policy regarding RF exposure must be informed

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[5] *See Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, Report and Order, 11 FCC Rcd 15123, 15124 ¶ 2, 15128 ¶ 12, 15129-30 ¶ 15, 15134-35 ¶ 28, 15141-42 ¶ 49 (1996) ("1996 Guidelines Order").

[6] *See Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies*, First Report and Order Further Notice of Proposed Rule Making and Notice of Inquiry, 28 FCC Rcd 3498, 3582 ¶ 236 (2013) ("2013 Reassessment Order").

[7] FDA, *Cell Phones*, https://www.fda.gov/radiation-emitting-products/home-business-and-entertainment-products/cell-phones (content current as of May 13, 2021).

[8] ICNIRP, *Mobile Phones: Radiofrequency – RF EMF*, https://www.icnirp.org/en/applications/mobile-phones/index.html (last visited Oct. 21, 2026).

[9] IEEE Standards Coordinating Committee 39, IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz, IEEE Std C95.1-2019 (2019) at 15 ("IEEE 2019 Standard").

[10] Letter from Ajit Pai, President & CEO, CTIA, to Vince Haley, Director, Domestic Policy Council, Executive Director, Make America Healthy Again Commission (Apr. 28, 2025) ("April 2025 CTIA Letter to MAHA Commission").

[11] RFI, *supra* note 2, at 59792.

[12] *Id.*

by the weight of evidence from peer-reviewed, methodologically-sound studies conducted by recognized scientific institutions.

Secretary Kennedy has described the Administration's commitment to grounding agency decision-making in science, explaining that President Trump instructed him to return regulatory agencies "to the gold standard empirically based, evidence-based science and medicine that they were once famous for."[13] Consistent with that objective, CTIA urges HHS to weigh each submission received through this RFI according to its relative scientific quality. Anecdotal accounts, self-reported symptoms, unverified online reports, and claims lacking an evidentiary foundation—however sincerely held—are not scientific evidence and cannot establish a sound basis for federal health policy.

Question 2: CTIA's Perspective

"In your response, please describe which perspective(s) your comments represent: individual consumer, patient, family member, or caregiver; healthcare professional; worker with occupational exposure; equipment or product manufacturer; service or infrastructure provider; business; industry group; government; research entity; or another type of organization or perspective."

CTIA submits these comments as an association with broad membership representing the U.S. wireless communications industry. Its membership includes wireless service and infrastructure providers, device and equipment manufacturers, suppliers, and companies operating in the applications and content sectors. The wireless industry is a major driver of U.S. economic growth. In 2025, the industry spent "nearly $30 billion to build new sites, upgrade existing infrastructure, and expand new offerings like 5G Home, making wireless even more accessible, reliable, and affordable for all Americans."[14]

For more than three decades, CTIA and its member companies have maintained an active, collaborative dialogue with federal and state regulators and public health authorities regarding RF exposure from wireless devices and infrastructure. CTIA members devote significant time and resources to designing, testing, and deploying devices and infrastructure in a manner that complies with federal RF exposure requirements and does not harm customers, employees, and the public.

Since its formation in 1984, CTIA has supported efforts to promote the safe use of wireless technology. CTIA has been a consistent, active participant in the FCC's RF exposure proceedings. In the FCC's reassessment of its RF exposure limits and policies, CTIA filed comprehensive comments, reply comments, and an opposition to a petition for reconsideration, urging the FCC to maintain its science-based approach and to confirm that existing standards adequately protect public health.[15] CTIA continued that engagement in 2020 in response to the FCC's targeted changes to its RF exposure rules, again citing the scientific consensus supporting

[13] Steve Inskeep, *RFK Jr. Discusses Potential Role in the Trump Administration and Health Policy Vision*, NPR (Nov. 6, 2024), https://www.npr.org/2024/11/06/nx-s1-5181197/rfk-jr-discusses-potential-role-in-the-trump-administration-and-health-policy-vision.

[14] CTIA, 2026 Annual Survey Highlights (Sep. 9, 2026), https://www.ctia.org/news/2026-annual-survey-highlights.

[15] *See* Comments of CTIA, ET Docket No. 13-84, WT Docket No. 03-137 (filed Sep. 3, 2013); Reply Comments of CTIA, ET Docket No. 13-84, WT Docket No. 03-137 (filed Nov. 18, 2013); Opposition of CTIA to Petition for Reconsideration (Erratum), ET Docket No. 13-84, WT Docket No. 03-137 (filed Sep. 12, 2013).

the safety of current RF limits, including for 5G technology.[16] In April 2025, CTIA submitted a detailed letter to the White House's MAHA Commission reiterating the decades-long scientific and legal consensus that RF exposure from wireless devices does not pose health risks to adults or children.[17] Among other things, CTIA highlighted the 2022 MOBI-Kids Study, which investigated brain tumors and wireless phone use across 14 countries and found "no evidence of a causal association between wireless phone use and brain tumours in young people."[18]

Across every filing, CTIA has championed a science-based regulatory framework, supported RF safety research, and taken efforts to make that research accessible to the public. As detailed in response to Question 12 below, the scientific consensus is that RF exposure at or below current federal limits does not cause adverse health effects.

Question 5: Exposure Standards and Regulatory Frameworks

"What existing national and international exposure standards, guidelines, or regulatory frameworks should federal health agencies consider when evaluating the potential adverse health effects of human exposure to RF/EMF? n. What scientific, technical, or regulatory changes by federal health agencies, if any, would improve the assessment, disclosure, and regulation of wireless radiation exposure? o. Is additional research needed to develop, test, and evaluate the effectiveness of procedures and techniques for minimizing exposure to electronic product radiation? Where are the largest gaps, if any, in knowledge? What research is needed to appropriately evaluate current or future national and international exposure standards, guidelines, or regulatory frameworks. p. How, if at all, should a classification system account for exposure-related characteristics, including operating frequency, power density, specific absorption rate (SAR), electric- and magnetic-field strength, modulation and pulse characteristics, duty cycle, beamforming, simultaneous exposure to multiple frequencies, duration of exposure, distance from the source, proximity to the body, and cumulative exposure over time?"

The FCC's existing science-based standard remains the appropriate framework for evaluating RF exposure. As detailed in response to Question 12, the FCC's RF exposure limits were developed with input from federal health and safety agencies, are informed by the IEEE and ICNIRP standards, and incorporate a 50-fold safety factor.[19] As also discussed in response to Question 12, the weight of the scientific record demonstrates that these standards protect the public, and the scientific consensus does not support changing the FCC's exposure limits.

In such regards, CTIA notes that the FCC is responsible for addressing the D.C. Circuit's remand in *Environmental Health Trust v. FCC.* In *Environmental Health Trust v. FCC*, the D.C. Circuit affirmed the FCC's conclusion that RF exposure below current limits does not cause

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[16] *See* Reply Comments of CTIA, ET Docket No. 19-226 (filed July 20, 2020) (quoting American Cancer Society, Cell Phone Towers, https://www.cancer.org/cancer/risk-prevention/radiation-exposure/cellular-phone-towers.html, (last revised June 26, 2026) (finding that 5G RF waves, while higher frequency than prior generations, were still non-ionizing and potentially less likely to penetrate the body than lower frequency waves).

[17] *See* April 2025 CTIA Letter to MAHA Commission, *supra* note 10.

[18] G. Castaño-Vinyals, et al., *Wireless phone use in childhood and adolescence and neuroepithelial brain tumours: Results from the international MOBI-Kids study,* 160 Environment International 107069, 2 (2022) ("MOBI-Kids Study"); April 2025 CTIA Letter to MAHA Commission at 2, *supra* note 10.

[19] *See 1996 Guideline Order*, 11 FCC Rcd at 15124 ¶ 2; *2013 Reassessment Order*, 28 FCC Rcd at 3582 ¶ 236.

cancer, finding the FCC's reliance on ICNIRP guidelines and the weight of scientific evidence sufficient to support the agency's determination on cancer risk.[20] The court remanded, for further explanation, the FCC's treatment of certain other non-cancerous health effects from RF exposure asserted by the petitioners, but did not find the existing standards inadequate. CTIA provides more detailed information in its comments filed in response to the FCC's Public Notice seeking public comment on RF exposure and incorporates those comments herein.[21] As described above, the existing scientific record, including the IEEE's comprehensive 2019 review, provides ample support for such an explanation.

Question 6: Scientific Evidence Regarding Current Exposure Limits

"What scientific evidence exists about potential adverse health effects caused by current exposure limits?"

The weight of the scientific evidence shows no adverse health effects for exposure at or below current exposure limits. As discussed in detail in response to Question 12, the scientific consensus does not support the existence of adverse health effects in humans caused by exposure at or below current RF exposure limits.

Question 8: Improvements in Exposure Assessment Methodologies

"What, if any, improvements in exposure assessment methodologies are needed to better evaluate real-world exposure conditions?"

Existing exposure assessment methodologies are conservative and adequately account for real-world conditions. For example, the FCC's equipment authorization process requires compliance testing for all wireless devices sold in the United States, using test parameters that reflect real-world use, including operation at maximum time-averaged power and in positions close to the body.[22] As devices automatically reduce power to the lowest level needed to maintain a connection, real-world exposures will usually be below the levels measured during compliance testing.[23] Because, as discussed in response to Question 12, the scientific consensus identifies no adverse health effects at or below current RF exposure limits, there is no demonstrated need for new exposure assessment methodologies.

Question 9: Disclosure of Technical and Exposure-Related Information

"What, if any, technical and exposure-related information should be disclosed to consumers, residents, workers, schools, healthcare providers, and local governments?"

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[20] *Envtl. Health Tr. v. FCC*, 9 F.4th 893 (D.C. Cir. 2021).

[21] *See* Comments of CTIA, ET Docket No. 13-84 (forthcoming filing Oct. 22, 2026); *RF Exposure Issues Subject to D.C. Circuit Remand in Environmental Health Trust v. FCC*, Public Notice, ET Docket No. 13-84, DA 26-997 (Rel. Sep. 17, 2026).

[22] *See* 47 C.F.R. §§ 1.1310, 2.1091, 2.1093 (for portable and mobile devices, generally identifying usage as approximately 20 centimeters away from the body of the user).

[23] *See* ICNIRP, *Mobile Phones: Radiofrequency – RF EMF*, https://www.icnirp.org/en/applications/mobile-phones/index.html (last visited Oct. 21, 2026) ("To save energy, a mobile phone automatically regulates the signal strength and hence the emitted field to the lowest power level possible to enable a connection to be made.").

The FCC already maintains comprehensive public disclosure requirements for authorized consumer devices and facilities.[24] Every wireless device sold in the United States must undergo FCC equipment authorization and testing demonstrating that it does not exceed the FCC's safety factor (*i.e.*, the 1.6 W/kg Specific Absorption Rate ("SAR") limit) before it may be legally marketed.[25] The test reports supporting those certifications are part of the equipment authorization records maintained by the FCC's Office of Engineering and Technology.[26] Members of the public can locate the unique FCC ID on any authorized device and use it to obtain that device's data, including any RF testing data, from the FCC's database.[27] In addition, the FCC's RF exposure rules provide for training, physical access controls, barriers, and signage, including multiple categories of RF advisory signs, to mitigate exposure at any radio installations where exposure may exceed public limits.[28] These existing requirements provide consumers, workers, schools, healthcare providers, and local governments with accurate, standardized information. Moreover, mandating or requiring more disclosures would conflict with the FCC's "legitimate interest in guarding against 'overwarning' about the potential dangers of a product sold to consumers," and the FCC's "considered policy judgment regarding how best and in what form to disseminate relevant information about RF exposure to the public."[29] As the *Cohen* court noted, the FCC's view is that: "'Given the federal safety determination' that RF emissions from certified cell phones pose no health risks, the Commission concluded that the information on its website 'and in device manuals' was not only 'adequate to inform consumers of [RF exposure] issues,' but also did 'not risk contributing to an erroneous public perception or overwarning of RF emissions from FCC certified or authorized devices.'"[30]

Question 10: Data Sources and Surveillance Systems

"What data sources or surveillance systems currently exist to monitor potential adverse health effects associated with RF radiation exposure? Should additional data sources or surveillance systems be developed? Please discuss the benefits and challenges of the following data sources and surveillance systems, as relevant: a. disease registries; b. occupational monitoring; c. environmental monitoring; d. longitudinal cohort studies; e. biomonitoring; f. adverse event reporting; g. disease or illness clusters; h. Other."

The weight of the scientific evidence does not support a need for the development of an RF-specific surveillance system. As described further in response to Question 12, the consensus of the scientific community is that no reliable evidence establishes that RF exposure within

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[24] *See Cohen v. Apple Inc.*, 497 F. Supp. 3d 769, 783 (N.D. Cal. 2020) (The FCC "affirmed a commitment to 'ensur[ing] that relevant information is made available to the public.'"), *aff'd*, 46 F.4th 1012 (9th Cir. 2022).

[25] *See* 47 C.F.R. §§ 1.1310, 2.1091, 2.1093; *see also infra* at Question 12 (discussing the SAR limit).

[26] *See* FCC, *Equipment Authorization Search*, https://apps.fcc.gov/oetcf/eas/reports/GenericSearch.cfm.

[27] *See* 47 C.F.R. § 2.935; National Cancer Institute, Cell Phones and Cancer Risk, https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/cell-phones-fact-sheet (reviewed April 4, 2024) ("NCI Cell Phone Fact Sheet") (explaining that consumers can access SAR information "using the phone's FCC ID number, which is usually located on the case of the phone, and the FCC's ID search form").

[28] *See* 47 C.F.R. § 1.1307(b)(4).

[29] *Cohen*, 497 F. Supp. 3d at 785 (citations omitted).

[30] *Id.* at 784 (citations omitted); *see also* Statement of Interests of the United States, filed in *Cohen v. Apple, Inc.*, Case No. 19-05322, Dkt. 101-1 at 18 (N.D. Cal. April 13, 2020).

current limits causes adverse health effects. In the absence of credible evidence of causation, a new RF-specific surveillance framework would not generate reliable or policy-relevant information beyond that provided by existing research and public health monitoring tools.

Surveillance systems are designed to allow regulators to track adverse events, many of which are known or anticipated to occur with the use of, or exposure to, particular medical products. But the scientific consensus is that, for RF exposure below current limits, there are no adverse events, no accepted biological mechanism, and no dose-response relationship. A system built to monitor claims of harm not recognized by the consensus of the scientific community is unnecessary and would be infeasible.

And the United States already maintains robust, cause-neutral health surveillance, including CDC's National Program of Cancer Registries and NCI's Surveillance, Epidemiology, and End Results ("SEER") program, which together provide cancer data for the entire U.S. population,[31] and a statutory cancer-cluster framework,[32] which may result in investigations applying the best available science and a weight-of-the-evidence approach to standardized surveillance data. These tools enable researchers and policymakers to "[m]onitor cancer trends over time" and "identify high-risk groups."[33] Because these systems do not presuppose a cause, they allow scientists both to identify emerging health concerns and to investigate various potential causes.[34] No rationale exists for a new system built around a single, narrow concern that the record does not support.

Existing HHS surveillance systems were designed for products whose adverse events can be clinically defined, and they cannot be meaningfully adapted to RF exposure. HHS and FDA maintain post-market surveillance infrastructure for certain medical and regulated products. Unlike wireless devices or infrastructure emitting RF, however, reliable scientific evidence establishes a link between those products and known adverse effects. Thus, the surveillance systems were designed around specific FDA-regulated products and the adverse events associated with their use. They were not designed for the impossible task of monitoring non-specific, conjectural effects of RF exposure, and they would be ill-suited to that task even if it were possible. Each category identified in Question 10 has structural limitations that would prevent it from producing reliable RF-specific data:

- Disease registries and occupational monitoring track disease incidence but are not designed to link outcomes to specific sources, and their coverage and data quality vary.

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[31] *See* CDC, *National Program of Cancer Registries*, https://www.cdc.gov/national-program-cancer-registries/index.html (last visited Oct. 21, 2026); National Cancer Institute, *Surveillance, Epidemiology, and End Results Program*, https://seer.cancer.gov/ (last visited Oct. 21, 2026); CDC, *About the National Program of Cancer Registries*, (Sep. 14, 2026), https://www.cdc.gov/national-program-cancer-registries/about/index.html ("Together, NPCR and SEER collect cancer data for the entire U.S. population.").

[32] *See* 42 U.S.C. § 280g-17.

[33] CDC, *About the National Program of Cancer Registries*, *supra* note 31.

[34] Additionally, monitoring tools, such as the SEER data, have not shown an increase in the rates of brain and other nervous system cancers despite a massive increase in mobile phone use over the last thirty years, with 331 million American adults owning a mobile phone as of 2024. *See* National Cancer Institute, *Cancer Stat Facts: Brain and Other Nervous System Cancer*, https://seer.cancer.gov/statfacts/html/brain.html (last visited Oct. 21, 2026); Alexis Bazen et al., *Cell Phone Statistics (2026)*, ConsumerAffairs (Jan. 22, 2026), https://www.consumeraffairs.com/cell_phones/cell-phone-statistics.html; *see also infra* Question 12.

- Environmental monitoring and disease cluster investigations are typically built around localized exposures measured on population-level data rather than individual exposure histories and depend on a defined exposure to separate a true cluster from random variation or are measured within a specific time frame and site or geographic area, respectively.
- Longitudinal cohorts and biomonitoring programs were not designed to measure RF exposure, because such exposure cannot reliably be measured or tracked through standard biological sampling. The National Health and Nutrition Examination Survey, for example, does not include RF as a measured exposure.
- Adverse event reporting systems are highly dependent on high-quality data and on identification of a specific product, an identifiable reporter, and a narrowly defined serious health event tied to product use.

None of these elements is readily replicable for ambient, multi-source RF exposure.

An RF surveillance system would be unworkable because exposure cannot be attributed, defined, or reported. As explained above, surveillance systems are deployed to monitor known or anticipated risks. Where, as here, the scientific consensus identifies no adverse effects for RF exposure within current limits, there is no risk for a surveillance system to monitor. Moreover, even if there were, an RF surveillance system would be unworkable in practice. A fundamental barrier to any RF surveillance system would be the inability to attribute health outcomes to a specific RF source. RF energy is ubiquitous, with continuously varying ambient emissions and background exposure from many natural and artificial sources. Under these conditions, attempts to isolate exposure to a particular source would be inherently unreliable.

Existing surveillance frameworks also depend on a common definition of a serious adverse event. The prevailing scientific evidence, which fails to identify any adverse effects from RF exposure within current limits, makes it impossible to define a serious adverse event. Without adverse event definitions or a dependable means of isolating exposure, no reliable reporting pathway exists. Although HHS, in some contexts, can rely on clinicians to report, that is impossible here because no clear diagnostic or case definition criteria exist for RF exposure, and they would be necessarily and completely reliant on unreliable self-reporting. Cell phone manufacturers similarly have no counterpart to pharmaceutical and medtech medical-affairs or prescriber networks. And direct consumer self-reporting would be unreliable and speculative for many reasons, including due to the lack of an identifiable causation event.

Given the scientific community's consensus regarding the absence of associated health risk and everything that flows from that, a new system with indefinite reporting criteria would impose significant public and private costs without any corresponding public health benefit.

Question 11: Risks For Specific Sensitive Populations

"Should exposure assessment or risk evaluation differ for sensitive populations such as those noted below? Please explain. a. children; b. pregnant woman; c. older adults; d. individuals with implanted medical devices; e. workers with elevated occupational exposure; f. individuals with

preexisting medical conditions; g. other populations that may uniquely experience potential adverse health effects in response to RF radiation."

CTIA recognizes the particular public interest in children's exposure to RF emissions, which the RFI identifies as a priority.[35] The consensus of the scientific health and safety community is that the evidence—including evidence from studies specifically addressing children—does not support the premise that children experience adverse health effects from RF exposure within current limits. The FCC's 50-fold safety factor is designed to protect all members of the public, including potentially sensitive groups.[36]

Numerous federal agencies and standard-setting organizations have noted that sensitive populations, such as those identified in Question 11, do not need additional protection. For example, the IEEE concluded in its 2019 comprehensive review that there is "no evidence to support the need for a special precautionary approach for children or adults."[37] Similarly, the FDA has stated that "scientific evidence does not show a danger to users of cell phones from radio frequency exposure, including children and teenagers."[38] The National Cancer Institute ("NCI") has confirmed that "the data from studies of children with cancer do not suggest that children are at increased risk of developing cancer from cell phone use."[39] The European Commission's Scientific Committee on Emerging and Newly Identified Health Risks ("SCENIHR") concluded that "[e]pidemiological studies do not indicate increased risk for other malignant diseases, including childhood cancer."[40] The UK Advisory Group on Non-Ionising Radiation found "no convincing evidence that radiofrequency field exposures below guideline levels cause health effects in either adults or children."[41] And, the 2022 MOBI-Kids Study, which included 899 participants ages 10 to 24 diagnosed with brain tumors and 1,910 matched controls across 14 countries, found "no evidence of a causal association between wireless phone use and brain tumours in young people."[42]

Question 12: Scientific Evidence Regarding Health Effects Below Current Exposure Limits

"What scientific evidence exists regarding potential adverse health effects associated with RF radiation exposure at levels below current federal exposure limits?"

The weight of scientific evidence establishes the absence of adverse health effects from RF exposure at or below current federal limits. The FCC's standards incorporate a 50-fold

[35] RFI, *supra* note 2, at 59792.

[36] *See 2013 Reassessment Order*, 28 FCC Rcd at 3582 ¶ 236.

[37] IEEE 2019 Standard, *supra* note 9, at 146.

[38] FDA, *Cell Phones*, https://www.fda.gov/radiation-emitting-products/home-business-and-entertainment-products/cell-phones (content current as of May 13, 2021).

[39] NCI Cell Phone Fact Sheet, *supra* note 27.

[40] *Opinion of the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) on the Potential Health Effects of Exposure to Electromagnetic Fields (EMF)*, at 5 (Jan. 27, 2015), available at http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_041.pdf.

[41] UK Health Security Agency, *Mobile Phone Base Stations: Radio Waves and Health* (July 30, 2024), https://www.gov.uk/government/publications/mobile-phone-base-stations-radio-waves-and-health/mobile-phone-base-stations-radio-waves-and-health.

[42] MOBI-Kids Study, *supra* note 18, at 2.

safety factor, setting exposure limits 50 times below the level at which adverse biological effects have been observed in laboratory animals.[43] This substantial margin of safety is designed to protect all members of the public, including sensitive populations.[44] The FCC's localized SAR limit of 1.6 W/kg[45] is more conservative than the 2.0 W/kg international standard established by ICNIRP.[46] The FCC has periodically reviewed and reaffirmed the adequacy of its standards, including in 1997 and 2019, each time concluding that the existing limits remain protective of public health.[47] Additionally, in 2019, the FCC confirmed that "phones legally sold in the United States pose no health risks."[48]

Expert technical bodies and federal and international health agencies confirm that current standards protect the public and workers. The conclusion that current RF exposure limits are protective is not only an industry position. Rather, this position is demonstrated in the comments and findings of leading health and scientific authorities in the United States and around the world.

Federal health agencies in the United States have consistently reached this conclusion. In its 2020 review of the scientific literature published between 2008 and 2018, the FDA concluded that there is "insufficient evidence to support a causal association between RFR exposure and tumorigenesis."[49] The CDC has similarly stated: "At this time we do not have the science to link health problems to cell phone use."[50] And NCI has found "no known mechanism by which non-ionizing EMFs could damage DNA and cause cancer."[51]

Leading standard-setting bodies agree. The IEEE's comprehensive 2019 review found "no reproducible low-level (nonthermal) adverse health effects" and concluded that "the scientific consensus is that there are no accepted theoretical mechanisms" for such effects.[52] ICNIRP likewise has found that acute and long-term effects of mobile phone RF exposure "have

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[43] *2013 Reassessment Order*, 28 FCC Rcd at 3582 ¶ 236.

[44] *Id.*

[45] *1996 Guidelines Order*, 11 FCC Rcd at 15140-41 ¶ 46, 15146-47 ¶ 62; 47 C.F.R. § 2.1093(d)(2).

[46] *See 2013 Reassessment Order*, 28 FCC Rcd at 3504-05 ¶ 13.

[47] *See Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, Second Memorandum Opinion and Order, and Notice of Proposed Rulemaking*, 12 FCC Rcd 13494 (1997) (affirming the FCC's previously adopted RF exposure limits) ("1997 Review"); *Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields; Reassessment of Federal Communications Commission Radiofrequency Exposure Limits and Policies, Targeted Changes to the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields*, Resolution of Notice of Inquiry, Second Report and Order, Notice of Proposed Rulemaking, and Memorandum Opinion and Order, 34 FCC Rcd 11687, 11696 ¶ 14 (2019) ("*Resolution of Notice of Inquiry*").

[48] *Resolution of Notice of Inquiry*, 34 FCC Rcd at 11696 ¶ 14.

[49] FDA, *Review of Published Literature between 2008 and 2018 of Relevance to Radiofrequency Radiation and Cancer*, at 6 (Feb. 2020), https://www.fda.gov/media/135043/download ("FDA 2020 Literature Review").

[50] CDC, *Facts About Cell Phones and Your Health* (July 16, 2026), https://www.cdc.gov/radiation-health/data-research/facts-stats/cell-phones.html.

[51] National Cancer Institute, *Electromagnetic Fields and Cancer* (May 30, 2022), https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/electromagnetic-fields-fact-sheet ("NCI EMF Fact Sheet").

[52] IEEE 2019 Standard, *supra* note 9, at 15.

been studied extensively without showing any conclusive evidence of adverse health effects," and that research on headaches, concentration, sleep quality, cognitive function, and cardiovascular effects "has not shown any such health effects."[53]

International and foreign government health authorities have also reached similar conclusions. The World Health Organization ("WHO") has stated that no adverse health effects have been established as being caused by mobile phone use and that "there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects."[54] WHO also noted that "disparities in EMF standards around the world [have] caused increasing public anxiety about EMF exposures from the introduction of new technologies," commenced "a process of harmonization of electromagnetic fields (EMF) standards worldwide," and found "[t]he main conclusion from the WHO reviews is that EMF exposures below the limits recommended in the ICNIRP international guidelines do not appear to have any known consequence on health."[55]

In Europe, SCENIHR concluded that "no health effect has been consistently demonstrated at exposure levels below the safety limits[,]"[56] which were even less conservative than the FCC standards. In the United Kingdom, the UK Health Protection Agency has stated there is "no clear evidence of adverse health effects from the use of mobile phones or from phone masts,"[57] and Cancer Research UK has stated that "[u]sing mobile phones does not increase the risk of cancer."[58] Health Canada, too, has found "no health risks from exposure to the low levels of radiofrequency EMF" emitted by wireless devices.[59]

Recent epidemiological studies confirm there is no increased health risk from RF exposure. As discussed in response to Question 11, the MOBI-Kids study, a multinational

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[53] ICNIRP, Mobile Phones: Radiofrequency – RF EMF, https://www.icnirp.org/en/applications/mobile-phones/index.html (last visited Oct. 21, 2026).

[54] World Health Organization, *Base stations and wireless technologies*, World Health Organization, (May 2006), https://www.who.int/teams/environment-climate-change-and-health/radiation-and-health/non-ionizing/wireless.

[55] World Health Organization, *Protection norms and standards*, World Health Organization, https://www.who.int/teams/environment-climate-change-and-health/radiation-and-health/protection-norms. The Australian Radiation Protection and Nuclear Safety Agency reached a similar conclusion based on a review of international standards, citing to a finding that an "important reason for the fact that exposure limits differ substantially in different countries is the vulnerability of political intervention and activist pressure in these national decisions." Australian Radiation Protection and Nuclear Safety Agency, *Comparison of radiofrequency electromagnetic field exposure limits worldwide*, at 9 (Jan. 17, 2024), https://www.arpansa.gov.au/comparison-radiofrequency-electromagnetic-field-exposure-limits-worldwide.

[56] European Commission, Public Health, *Electromagnetic Fields* (2008), https://ec.europa.eu/health/scientific_committees/opinions_layman/en/electromagnetic-fields07/l-2/11-conclusions.htm.

[57] EMF Explained 2.0, *UK Health Protection Agency – Updated Information on Mobile Phones and Masts*, https://emfexplained.info/pol/?ID=25647 (last visited Oct. 21, 2026).

[58] Cancer Research UK, *Cancer myths and common questions, Do Mobile Phones or Wi-Fi Cause Cancer?*, https://www.cancerresearchuk.org/about-cancer/causes-of-cancer/cancer-myths-questions/do-mobile-phones-cause-cancer (last visited Oct. 21, 2026).

[59] Government of Canada, *5G Technology, Cell Phones, Cell Phone Towers and Antennas* (Nov. 20, 2022), https://www.canada.ca/en/health-canada/services/health-risks-safety/radiation/everyday-things-emit-radiation/cell-phones-towers.html.

epidemiologic study spanning 14 countries and involving children and young adults aged 10 to 24, did not find evidence demonstrating a causal association between the use of wireless phones and brain tumors.[60] A 2024 WHO-commissioned systematic review of epidemiological literature concluded that RF exposure "does not increase the risk of glioma, meningioma, acoustic neuroma, pituitary tumors, salivary gland tumors in adults, or of paediatric brain tumours."[61] NCI has concluded that large cohort studies are consistent: a cohort of more than 358,000 cell phone users in Denmark found no association with glioma, meningioma, or acoustic neuroma, and a multinational Cohort Study of Mobile Phones and Health involving 264,574 participants in Denmark, Finland, Sweden, the Netherlands, and the United Kingdom found that cumulative call time was not associated with these tumors, even among the heaviest users and those with 15 or more years of use.[62]

Population-level data also reinforce these findings. Studies have found stable brain cancer incidence rates for adult gliomas in the United States and other advanced economies over the past several decades, stable incidence of pediatric brain tumors in the United States from 1993 to 2013, and stable incidence of acoustic neuroma and meningioma among adults in the United States since 2009.[63] These trends continue in the face of the dramatic increase in mobile phone use over the same period.[64] If RF exposure increased the risk of brain cancer, one would expect a corresponding increase in incidence, yet the data show no such trend.[65]

The animal studies support the scientific consensus. In 2013 the IARC concluded that there was "limited" evidence in animal studies "for the carcinogenicity of radiofrequency radiation."[66] Since then the animal studies have only strengthened the scientific consensus that RF emissions at or below the current standard do not cause adverse health effects in humans. The National Toxicology Program ("NTP") conducted two studies that exposed rodents to 900 MHz and 1,900 MHz CDMA- or GSM-modulated RF at whole-body SARs substantially exceeding the FCC's 1.6 W/kg localized limit and far exceeding the whole-body limit applicable to the public.[67] The NTP Mice Study found no statistically significant glioma or heart

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[60] MOBI-Kids Study, *supra* note 18, at 2.

[61] Ken Karipidis et al., *The Effect of Exposure to Radiofrequency Fields on Cancer Risk in the General and Working Population: A Systematic Review of Human Observational Studies – Part I: Most Researched Outcomes*, 191 Env't Int'l 108983, at 2 (Sep. 2024), https://www.sciencedirect.com/science/article/pii/S0160412024005695.

[62] NCI Cell Phone Fact Sheet, *supra* note 27 (summarizing Danish Cohort Study and COSMOS findings).

[63] *Id.*

[64] *See, e.g.*, Alexis Bazen et al., *Cell Phone Statistics* (2026), ConsumerAffairs (Jan. 22, 2026), https://www.consumeraffairs.com/cell_phones/cell-phone-statistics.html.

[65] *See* MP Little et al., *Mobile phone use and glioma risk: comparison of epidemiological study results with incidence trends in the United States*, 344:e1147 British Med. J. 1, 3 (2012); Isabelle Deltour et al., *Mobile Phone Use and Incidence of Glioma in the Nordic Countries 1979-2008: Consistency Check*, 23 Epidemiology, no. 2, at 301-307 (2012); Simon Chapman et al., *Has the Incidence of Brain Cancer Risen in Australia Since the Introduction of Mobile Phones 29 Years Ago?*, 42 Cancer Epidemiology, June 2016, at 199-205.

[66] International Agency for Research on Cancer, *Non-ionizing Radiation, Part 2: Radiofrequency Electromagnetic Fields*, 102 IARC Monographs on the Evaluation of Carcinogenic Risks to Humans 419, § 6.1 (2013) (emphasis omitted).

[67] *See* National Toxicology Program, *Technical Report on the Toxicology and Carcinogenesis Studies in B6C3F1/N Mice Exposed to Whole-Body Radio Frequency Radiation at a Frequency (1,900 MHz) and Modulations (GSM and CDMA) Used by Cell Phones*, NTP TR 596, at xvi-xviii (Nov. 2018) ("NTP Mice Study") (testing exposures at 2.5,

schwannoma in either male or female mice at any of the three SAR exposure levels for either CDMA- or GSM-modulated RF.[68] In the NTP Rat Study, NTP reported statistically significant incidence increases in heart schwannoma only in male rats exposed to CDMA-modulated RF and only at the highest exposure level of 6 W/kg.[69] There were no statistically significant increases in the incidences of heart schwannoma in male rats to GSM-modulated RF or in female rats at any exposure level of either modulated signal.[70] There also were no statistically significant increases in incidences of glioma in either male or female rats at any exposure level of either modulated signal.[71] NTP reported a statistically significant trend for glioma only in male rats exposed to CDMA-modulated RF, but the only tumor incidences supporting the trend were at the 6 W/kg exposure level, well above the FCC exposure limits.[72] The Ramazzini Institute ("Ramazzini") conducted a rat study designed to reproduce base-station exposure.[73] The study exposed rodents to a 1.8 GHz GSM far field at 0, 5, 25, and 50 V/m for 19 hours per day.[74] There were no statistically significant findings of glioma incidences.[75] The only statistically significant finding was an increase in heart schwannomas in male rats at the highest doses.[76]

Health agencies reviewed the NTP and Ramazzini Institute studies and concluded that while there were some limited positive findings, overall the studies do not show a human health risk. ICNIRP, which has concluded that "RF EMF exposure below the thermal threshold is unlikely to be associated with adverse health effects[,]"[77] noted that limitations of the NTP and Ramazzini Institute studies "preclude drawing conclusions about carcinogenicity."[78] NCI noted that "key details necessary for interpretation of the results were missing" from the Ramazzini Institute study.[79] The FDA's 2020 literature review covered both the NTP and Ramazzini Institute studies and concluded that "there is insufficient evidence to support a causal association

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5, and 10 W/kg); National Toxicology Program, *Technical Report on the Toxicology and Carcinogenesis Studies in Sprague Dawley (Hsd: Sprague Dawley SD) Rats Exposed to Whole-Body Radio Frequency Radiation at a Frequency (900 MHz) and Modulations (GSM and CDMA) Used by Cell Phones*, NTP TR 595, at xx-xxii (Nov. 2018) ("NTP Rat Study") (testing exposures at 1.5, 3, and 6 W/kg).

[68] NTP Mice Study, *supra* note 67, at xix.

[69] NTP Rat Study, *supra* note 67, at xxiv, 102.

[70] *Id.* at 117-18.

[71] *Id.* at 118-19.

[72] *Id.* at 104-05.

[73] *See* L. Falcioni et al., *Report of Final Results Regarding Brain and Heart Tumors in Sprague-Dawley Rats Exposed from Prenatal Life Until Natural Death to Mobile Phone Radiofrequency Field Representative of a 1.8 GHz GSM Base Station Environmental Emission*, 165 Env't Rsch. 496 (Aug. 2018).

[74] *Id.*, Abstract.

[75] *Id.*

[76] *See id.*

[77] *Mobile phones, Radiofrequency - RF EMF*, International Commission on Non-Ionizing Radiation Protection, https://www.icnirp.org/en/applications/mobile-phones/index.html, (last visited Oct. 16, 2026).

[78] ICNIRP, *ICNIRP Note Critical Evaluation of Two Radiofrequency Electromagnetic Fields Animal Carcinogenicity Studies Published in 2018*, at 531 (2019/2020), https://www.icnirp.org/cms/upload/publications/ICNIRPnote20192020.pdf.

[79] NCI Cell Phone Fact Sheet, *supra* note 27.

between RFR exposure and tumorigenesis," citing "a lack of clear dose response relationship, a lack of consistent findings or specificity, and a lack of biological mechanistic plausibility."[80] Additionally, the FCC has explained the limitations and flaws in both studies and noted that even NTP itself "has not suggested in its findings what this research may mean relative to human beings."[81]

Two independent studies published this year were designed to verify NTP's positive glioma and heart schwannoma findings but found no adverse effects associated with RF exposure from wireless devices. Researchers in Korea and Japan conducted parallel two-year studies to replicate NTP's key findings.[82] Neither study found a statistically significant increase in tumors of the brain, heart, or adrenal glands, and neither found DNA damage.[83] The Korean study concluded that long-term exposure "was neither carcinogenic nor genotoxic."[84] The Japanese study found "no reproducible evidence of carcinogenic or genotoxic effects," and concluded that its results "support the overall weight of evidence from previous RF safety evaluations."[85] The NTP and Ramazzini Institute studies' positive findings remain unreplicated, and the animal data overall remain consistent with the negative human data.

The science does not support a finding of other adverse health effects at or below current RF exposure limits. The IEEE's 2019 review specifically addressed reproductive and developmental effects and neurological and cognitive effects,[86] and found no credible evidence of adverse effects at exposure levels within current FCC limits. The IEEE found, for instance, that the evidence "does not suggest that teratogenic, reproductive, or developmental effects occur within the [limits] recommended" and that a "review of human provocation studies, including cognitive function and memory, electroencephalogram (EEG), sleep disturbances, event related potentials, headache and fatigue, hypersensitivity, and effects on blood pressure/heart rate, showed no consistent evidence of an adverse effect of low-level RF exposure on the nervous system."[87] With regard to base stations, WHO has concluded that there is "no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects."[88]

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[80] FDA 2020 Literature Review, *supra* note 49, at 6.

[81] *Resolution of Notice of Inquiry*, 34 FCC Rcd at 11693 n.33.

[82] Hye Sun Kim et al., *The International Collaborative Animal Study of the carcinogenicity and genotoxicity of mobile phone radiofrequency radiation: the Korean study*, 209(3) Toxicological Science 1 (March 2026) ("Korean NTP Study"); Katsumi Imaida et al., *The International Collaborative Animal Study of Mobile Phone Radiofrequency Radiation Carcinogenicity and Genotoxicity: The Japanese Study*, 209 Toxicological Scis. 3, at 1 (Mar. 2026) ("Japanese NTP Study").

[83] Korean NTP Study, *supra* note 82, at 1; Japanese NTP Study, *supra* note 82, at 1.

[84] Korean NTP Study, *supra* note 82, at 14.

[85] Japanese NTP Study, *supra* note 82, at 12.

[86] The FCC's limits primarily address thermal effects because the FCC has found asserted "non-thermal" effects to be "ambiguous and unproven." *See* FCC, *RF Safety FAQ*, https://www.fcc.gov/engineering-technology/electromagnetic-compatibility-division/radio-frequency-safety/faq/rf-safety (last visited Oct. 21, 2026); 47 C.F.R. §§ 1.1307, 1.1310.

[87] IEEE 2019 Standard, *supra* note 9, at 172, 155.

[88] World Health Organization, *Base Stations and Wireless Technologies*, *supra* note 54.

No known biological pathway exists for adverse health effects from RF exposure at or below current FCC limits. Wireless devices emit non-ionizing radiation, which is fundamentally different from ionizing radiation such as X-rays and gamma rays.[89] Non-ionizing radiation lacks sufficient energy to break chemical bonds, strip electrons from atoms, or directly damage DNA.[90] As NCI explains, the frequencies used by 2G through 5G devices "all fall in the nonionizing range of the spectrum," and "[t]he energy is too low to damage DNA."[91] NCI has further stated that there is "no known mechanism by which non-ionizing EMFs could damage DNA and cause cancer,"[92] and the IEEE has concluded that there are "no accepted theoretical mechanisms that would explain the existence of low-level adverse health effects."[93] For instance, the IEEE found, in its 2019 review, that the weight of the evidence confirms blood-brain barrier function "should not be affected within the limits of internationally accepted standards" and that oxidative stress "has not been adequately demonstrated in experimental studies" as a mechanism.[94] Further, recently, a World Health Organization-sponsored systematic review of over 12,000 RF-related oxidative stress studies found the evidence of a causal relationship to be of "very low certainty."[95] Because no credible biological pathway has been identified, there is no scientifically established mechanism linking compliant wireless devices to human harm.

Courts reviewing the scientific evidence have consistently rejected claims that RF exposure causes adverse health effects. Courts evaluating claims that wireless phones cause cancer or other illnesses have consistently concluded that no reliable evidence supports the conclusion that RF exposure below the current limits causes adverse health effects in adults or children. No U.S. court applying Federal Rule of Evidence 702 or its state law equivalent has allowed expert testimony asserting that RF emissions from wireless phones and equipment cause adverse health effects to be presented to a jury, finding such evidence unreliable. The judicial record over more than thirty years reflects the consistent failure of such claims to meet the threshold of reliable evidence.

Most recently, on September 28, 2026, the D.C. Superior Court excluded the general causation experts of a plaintiff alleging RF exposure from wireless devices and infrastructure caused adverse health effects. The Court ruled that the experts' opinions were not based on "sufficient facts or data," "the product of reliable principles and methods," and that the experts' opinions did not "reflect[] a reliable application of the principles and methods to the facts of the

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[89] *See* U.S. Environmental Protection Agency, *Non-Ionizing Radiation from Wireless Technology* (updated Mar. 24, 2026), https://www.epa.gov/radtown/non-ionizing-radiation-wireless-technology.

[90] *Id.*; Utah Department of Environmental Quality, *Radiation Basics*, https://deq.utah.gov/dwmrc/radiation-basics (last visited Oct. 21, 2026).

[91] NCI Cell Phone Fact Sheet, *supra* note 27.

[92] NCI EMF Fact Sheet, *supra* note 51.

[93] IEEE 2019 Standard, *supra* note 9, at 15.

[94] IEEE 2019 Standard, *supra* note 9, at 149-50, 192.

[95] Felix Meyer et al., *The effects of radiofrequency electromagnetic field exposure on biomarkers of oxidative stress in vivo and in vitro: A systematic review of experimental studies*, 194 Env't Int'l. 108940, 108940 (2024) ("The evidence on the relation between the exposure to RF-EMF and biomarkers of oxidative stress was of very low certainty, because a majority of the included studies were rated with a high RoB [risk of bias] level and provided high heterogeneity.").

case."[96] In a similar case, *Murray v. Motorola, Inc.*, the D.C. Court of Appeals affirmed [97] a D.C. Superior Court ruling that plaintiffs' general causation experts on the basis that their methodologies and conclusions were unreliable and insufficient to establish that RF exposure caused the alleged health effects.[98] In addition to *Murray*, the federal district court of Maryland, nearly 25 years ago, rejected reliance on the studies of Dr. Lennart Hardell, which have been identified as outliers inconsistent with the broader body of epidemiological evidence.[99] The consistent judicial rejection of RF health effects testimony and claims after intense litigation scrutiny underscores the paucity of supporting scientific evidence.

Question 13: Cumulative Exposure Patterns from Specific Technologies

"According to scientific evidence, how do the technologies below affect cumulative exposure patterns? a. 5G; b. 6G; c. Wi-Fi; d. Satellite-based communications; e. Internet of Things (IoT); f. Wearable technologies; g. Smart homes/appliances; h. Smart cities; i. Autonomous vehicles; j. Wireless medical devices; k. Communication enabled smart meters."

Because wireless technologies operate within protective RF exposure limits, there is no evidence that cumulative exposure patterns result in adverse health effects. All air interfaces and technologies, such as 3G, 4G, and 5G, operate in bands covered by the FCC's exposure limits, and are considered in the existing body of scientific evidence addressing those frequencies.[100] NCI notes that 2G through 5G frequencies "all fall in the nonionizing range of the spectrum."[101]

Notably, a 2021 state-of-the-science review specifically addressed "5G mobile networks and health" and found "no confirmed evidence that low-level RF fields above 6 GHz such as those used by the 5G network are hazardous to human health."[102] The review, which evaluated 107 experimental studies, included "various bioeffects including genotoxicity, cell proliferation, gene expression, cell signalling, membrane function and other effects[,]" and found "no confirmed evidence that low-level [millimeter waves] are associated with biological effects relevant to human health."[103]

Today's RF environment also includes many other sources, such as broadcast, satellite, Wi-Fi, and Bluetooth signals. As discussed in response to Question 12, the consensus of the scientific community is that RF exposure from developing wireless technology does not result in adverse health effects. Further, the FCC's rules already require that RF exposure from multiple

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[96] *See* Omnibus Ord. at 11-12, *Block v. Nokia, Inc., No. 2015-CA-002114-B (D.C. Super. Sep. 28, 2026).*

[97] *Murray v. Motorola, Inc.*, 339 A.3d 152 (D.C. 2025).

[98] *Murray v. Motorola, Inc.*, 2023 WL 6374279 (D.C. Super. Ct. Apr. 25, 2023).

[99] *See Newman v. Motorola, Inc.*, 218 F. Supp. 2d 769, 777-80, 783 (D. Md. 2002).

[100] *See* 47 C.F.R. § 1.1310; *see* ICNIRP, *Mobile Phones: Radiofrequency – RF EMF*, https://www.icnirp.org/en/applications/mobile-phones/index.html (last visited Oct. 21, 2026) (explaining that exact frequency bands "differ[] between technologies (GSM, UMTS, 4G, 5G, etc.)").

[101] NCI Cell Phone Fact Sheet, *supra* note 27.

[102] Ken Karipidis et al., *5G mobile networks and health — a state-of-the-science review of the research into low-level RF fields above 6 GHz*., 31 J. Exposure Sci. Env't Epidemiology 585, 585 (pub. Mar. 16, 2021).

[103] *Id*. at 585, 601.

simultaneously operating transmitters be evaluated in the aggregate against applicable limits.[104] Health Canada has expressly recognized that "at present, there is no scientific basis for the occurrence of acute, chronic and/or cumulative adverse health risks from RF field exposure at levels below the limits outlined in Safety Code 6."[105] The same can be said of future 6G devices and equipment.

Question 14: Scientific Evidence Regarding Environmental Effects

"What scientific evidence exists regarding potential adverse environmental effects associated with RF radiation?"

The FCC addresses RF exposure as part of its broader assessment of environmental impacts under the National Environmental Policy Act ("NEPA").[106] The FCC's NEPA regulations include guidelines for human exposure to RF energy emitted by FCC-regulated transmitters and facilities, "based on the recommendations of expert agencies and organizations with responsibilities for health and safety."[107] As described in response to Question 12, the scientific record does not demonstrate that RF exposure within these limits causes adverse environmental effects.

To the extent that HHS is seeking information on the impact of RF exposure from wireless technologies on environmental flora and fauna, several reports have been published. In 2023, a report was published summarizing the effects of "anthropogenic radiofrequency electromagnetic fields with frequencies above 100 MHz on flora and fauna[.]"[108] The report noted that "[f]or high frequencies exceeding 100 MHz, the only scientifically established action mechanism in organisms is the conversion of electromagnetic into thermal energy" and, "[i]n accordance with that, no proven scientific evidence of adverse effects in animals or plants under realistic environmental conditions has yet been identified from exposure to low-level anthropogenic radiofrequency fields in this frequency range."[109] The Australian Radiation Protection and Nuclear Safety Agency also conducted a review of literature and found "[f]or good quality studies, radio waves were not found to cause adverse effects on plants and animals."[110]

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[104] *See* 47 C.F.R. § 1.1307(b); *Resolution of Notice of Inquiry*, 34 FCC Rcd at 11716-21, ¶¶ 55-70.

[105] Health Canada, *Safety Code 6: Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz*, § 2 (2015), https://www.canada.ca/en/health-canada/services/publications/health-risks-safety/limits-human-exposure-radiofrequency-electromagnetic-energy-range-3-300.html.

[106] *See* 47 C.F.R. pt. 1, subpt. I.

[107] *2013 Reassessment Order*, 28 FCC Rcd at 3502 ¶ 8; 47 C.F.R. § 1.1310.

[108] Blanka Pophof et al., *Biological Effects of Radiofrequency Electromagnetic Fields above 100 MHz on Fauna and Flora: Workshop Report*, 124 Health Physics 31, 31 (Jan. 2023).

[109] *Id.*

[110] Chris Brzozek et al., *Investigating the impact of anthropogenic radiofrequency electromagnetic fields on animals and plants in the environment: analysis from a systematic map*, Australian Radiation Protection and Nuclear Safety Agency, https://www.arpansa.gov.au/research-and-expertise/electromagnetic-energy-program/electromagnetic-energy-research/investigating-impact-anthropogenic-radiofrequency-electromagnetic-fields-animals-and-plants-environment-analysis-systematic-map (citing Chris Brzozek et al., *Investigating the impact of anthropogenic*

Question 15: Evidence Regarding Wireless Infrastructure Exposure

"What types of scientific evidence should be considered when evaluating RF exposure associated with wireless infrastructure? Please comment on: a. proximity to homes, schools, childcare facilities, healthcare facilities, and/or workplaces; b. cumulative neighborhood exposure; c. antenna density; d. small-cell deployment; e. livestock."

The FCC's RF exposure regulations cover wireless infrastructure and protect both workers and the general public. They apply both to wireless devices and to the transmitters and infrastructure installed and operated by carriers and other service providers.[111] The FCC has found that its limits "reflect the best available information concerning safe levels of RF exposure for workers and members of the general public."[112] WHO has concluded that "there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects,"[113] and the UK Advisory Group on Non-Ionising Radiation reached the same conclusion with respect to base stations.[114] Nothing in the scientific record demonstrates that RF exposure within these limits causes adverse environmental effects. To the contrary, and as discussed in response to Question 12, the weight of scientific evidence confirms that RF exposure at or below current limits does not cause adverse effects.

Question 17: Federal Agency Coordination of EMF/RF Research

"How can federal health agencies improve coordination of EMF and RF radiation research? Please comment on potential roles for federal health agencies including, but not limited to: a. HHS Food and Drug Administration (FDA); b. HHS National Institutes of Health (NIH); c. HHS Centers for Disease Control and Prevention (CDC)."

Federal health agencies should coordinate with the FCC to maintain a science-based approach to RF exposure policy. The FCC has regulated RF exposure since 1985 and adopted its comprehensive framework in 1996.[115] For three decades, the FCC has served as the primary federal regulator of RF exposure, and it has done so effectively. Its regime is grounded in science and informed by the input of federal health and safety agencies, and the FCC has periodically reviewed and reaffirmed its standards, including in 1997 and 2019.[116] Accordingly, the FCC is uniquely positioned to continue leading RF exposure regulation. It possesses the technical expertise, established regulatory infrastructure, compliance-enforcement mechanisms, and longstanding relationships with regulatory expert and standard-setting bodies.

Health-focused agencies should provide scientific input while preserving the FCC's regulatory and standard-setting role. CTIA urges HHS to acknowledge the FCC's continued leadership and to ensure that any interagency coordination enhances, rather than displaces or

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radiofrequency electromagnetic fields on animals and plants in the environment: analysis from a systematic map, 81 Int'l J. Env't Studies 2343 (July 30, 2024).

[111] *See 2013 Reassessment Order*, 28 FCC Rcd at 3502 ¶ 8.

[112] *Resolution of Notice of Inquiry*, 34 FCC Rcd at 11688-89 ¶ 2.

[113] World Health Organization, *Base Stations and Wireless Technologies*, *supra* note 54.

[114] UK Health Security Agency, *Mobile Phone Base Stations: Radio Waves and Health*, *supra* note 41.

[115] *See 1985 FCC Order*, 100 F.C.C.2d 543; 1996 Guidelines Order, 11 FCC Rcd 15123, 15124.

[116] *See 1997 Review*, 12 FCC Rcd 13494 (1997); *Resolution of Notice of Inquiry*, 34 FCC Rcd 11687.

fragments, the FCC's regulatory authority. Any coordination framework should preserve the FCC's leadership in regulating and enforcing RF exposure standards while ensuring that health agencies provide scientific input during relevant consultation periods. Specifically, the FDA should retain both the authority and the resources to conduct independent scientific evaluations to support FCC rulemaking authority on RF exposure standards. HHS should support continued periodic FDA reviews of the scientific literature. The CDC's primary role with respect to RF exposure should be ensuring that public health communications accurately reflect the consensus of scientific evidence and clearly distinguish established findings from unverified or unreplicated claims.

HHS should not recommend changes to existing RF exposure standards absent a clear, compelling, and well-documented scientific basis—a standard the current evidence does not approach. At a minimum, HHS should await the FCC's forthcoming action on remand in *Environmental Health Trust*.[117] As the FCC recently informed the D.C. Circuit, "[o]n September 17, 2026, the FCC released a Public Notice to refresh the record on remand," "the FCC's action is an important step towards fulfilling the Court's mandate," and "the proceeding is now moving."[118]

Conclusion

For the reasons set forth above, CTIA respectfully submits that the overwhelming weight of scientific evidence, accumulated over decades of research by the United States' leading health agencies, expert technical bodies, and peer-reviewed epidemiological studies, demonstrates that RF exposure from wireless devices and equipment at levels permitted under current FCC standards does not pose health risks to the public. This is not simply industry advocacy. Rather, this is the independent conclusion of the FDA, WHO, ICNIRP, IEEE, CDC, NCI, Health Canada, the European Commission, Cancer Research UK, and numerous other respected institutions around the world.

Accordingly, CTIA urges HHS to ensure that any actions or recommendations resulting from this proceeding are firmly grounded in the weight of peer-reviewed scientific evidence and the established consensus of recognized expert bodies. HHS should resist calls to adopt measures that are not supported by reliable science and the scientific record and that could undermine public confidence in the safety of wireless technologies, impair access to critical communications services, including 9-1-1, and set a precedent for policy-making driven by fear rather than fact.

[117] *See* Opposition of Federal Communications Commission to Petition for a Writ of Mandamus (filed Sep. 25, 2026) in *In re Children's Health Defense*, No. 26-1121 (D.C. Cir.) at 9-10 (citations omitted).

[118] *Id.*

CTIA and its members remain committed to working with HHS, the FCC, and other federal agencies to ensure that RF exposure policy continues to reflect the best available science. CTIA welcomes continued engagement and would be pleased to provide additional information, arrange briefings with technical experts, or otherwise assist HHS in developing a rigorous, evidence-based record in this proceeding.

Respectfully submitted,

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