Section 3

A National Census of Electromagnetic Hypersensitivity (EHS, IEI-EMF), and EMF as a Potential Amplifier of Existing Health Conditions

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Scope: people who report symptoms they attribute to electromagnetic exposure, and people whose existing conditions may change how exposure affects them. **RFI questions answered:** 3(a) to 3(g), 4(h) to 4(m), 5(n), 5(o), 9 (healthcare providers), 10(a), 10(d) to 10(g), 11(a) to 11(d), 11(f), 11(g), 12, 13(j), 16, 17 and 17(a) to 17(c), each tagged in brackets where answered.

OUR PROPOSAL: NATIONAL PROGRAM FOR THE CHARACTERIZATION OF ELECTROMAGNETIC HYPERSENSITIVITY

EFEIA proposes to develop a national program for the systematic collection and analysis of information on people who report symptoms attributed to electromagnetic exposure, taking as its starting point its field experience and the assessment instruments it has developed over the years.

The program would apply questionnaires A and B in a standardized way, to collect information on technology-use habits, symptoms and patterns of perceived exposure.

Its aim would be a structured body of information that helps characterize the participating population, identify patterns that require further research and support the design of future scientific and clinical studies.

The program is conceived as a characterization and research initiative, not as a diagnostic test or a procedure that can by itself establish the cause of the symptoms.

1 SUMMARY OF THE ISSUE

1. People who report EHS. WHO states that the symptoms "are certainly real" and "can be a disabling problem", and that "there is no scientific basis to link EHS symptoms to EMF exposure" [1]. Surveys put self-reported EHS at 1.5% in Stockholm County and 3.2% of California adults [2,3]. In blinded tests people with EHS have not detected exposure reliably [4,5], but most such studies have design weaknesses, and the review that found them judges an effect unlikely though not excluded for a few individuals [6]. EFEIA recognizes the suffering without asserting a causation that has not been consistently shown.

2. Existing conditions. The limits derive from heating: ICNIRP takes 4 W/kg, associated with a 1 °C rise in core temperature, and divides it by 50 for the public limit of 0.08 W/kg [7]. EFEIA has found no study that tests, with measured exposure, whether exposure adds load to a condition a person already has; the signals are a reported group-level change in sleep EEG, not consistently replicated [8,9], more tumors in carcinogen-treated mice exposed from 0.04 W/kg [10] and lower sperm motility [11], while WHO-commissioned reviews of observational studies rate their evidence low or very low certainty [12,13] and ICBE-EMF authors dispute their methods [14].

3. What EFEIA has learned and proposes. NOXTAK, within whose ecosystem EFEIA works, reports more than ten years of field experience with more than 10,000 people, an organizational account [15]; its questionnaires were applied to 357 people in 2014-2018 [16], 15 students in 2022 [17] and 286 people enrolled in the 2025 EHS Global Census [18]. EFEIA proposes a voluntary 24-month National Census Plan built on questionnaires A and B [15], and five proposals on existing conditions (Part 7, P8 to P12).

Compliance is not protection. No limit refers to long-term duration, proximity during sleep or the health of the person exposed; 107 of 283 Census respondents (37.8%) sleep with the phone under the pillow or very close at least some nights [19]. In 1997 the FCC said independent evaluation was impracticable, "especially" of "whether certain individuals might be 'hypersensitive' or 'electrosensitive'" [20]; in 2026 it does not "anticipate affording such weight to unverifiable or repetitive testimonial submissions" [21]. Without systematic data, these people enter the record only as testimony.

2 WHY IT MATTERS [Q11(a)]

In Stockholm County, 12.1% of people reporting EHS were unemployed against 4.4% of referents [2]; in Taiwan, psychiatric comorbidity was 30.7% among people reporting sensitivity against 15.1% overall [22]. The U.S. Access Board stated in 2002 that electromagnetic sensitivities "may be considered disabilities under the ADA" when they substantially limit a major life activity [23]; CDC told France's health agency in 2015 that it had no data on EHS [24]. About 7 million U.S. children aged 3-17 (11.7%) have a current ADHD diagnosis [25], and pooled cohorts found more hyperactivity and inattention with high maternal phone use, with the caution that confounding may explain it [26]. EFEIA's 2022 school case in Doral, Florida, a selected series of 15 students aged 9-16, found 9 with scores of 59 or more on the 25-item symptom questionnaire, as score bands rather than diagnoses, with no comparison group [17].

3 CURRENT LIMITATION OR GAP [Q5(o)]

[Q9] **G1. No diagnostic pathway:** no clear [1] or validated [24] criteria and no HHS guidance on assessment, care or accommodation. [Q11(b), Q11(f)] **G2. Heating, not added load:** ICNIRP includes people "of differing health statuses" in the general public through larger reduction factors on the heating threshold [7]; a sleep disorder or a pregnancy is protected against heating only. **G3. Short laboratory exposures:** provocation studies test acute laboratory exposure [4,27] and rarely personalized exposure at home [28]. **G4. Exposure rarely measured over time:** cohorts rely on recalled phone use [26], no EHS follow-up had exceeded one year by 2018 [24], and the most recent metered U.S. pregnancy cohort carries an Expression of Concern because its data cannot be shared [29]. **G5. Co-exposure little studied:** a review of 25 in vivo papers rates the evidence inadequate for most tissues [30]; the main positive signal is one mouse model [10,31]. [Q10(f)] **G6. No systematic collection** of information on people reporting symptoms [20,21]. **G7. No validated instrument:** EFEIA's questionnaires have not been tested for reliability or validity [15,32]. [Q11(a)] **G8. Young and autistic people missing:** no U.S. study characterizes them and no adapted questionnaire exists yet [15].

4 EXISTING EVIDENCE [Q4(h), Q4(i), Q11(g), Q12]

[Q11(b) to Q11(d), Q11(f), Q13(j)] **Table 1.** The state of knowledge, by group. Values as printed in each source; all grade (a) unless stated.

Group	Evidence	What assessment should add
People who report EHS	46 blind or double-blind experiments, 1,175 volunteers: no robust evidence that exposure triggers symptoms; a role for nocebo [27]. 41 studies, 2,874 participants: IEI-EMF groups no better than others at determining exposure [4]‡. Co-designed protocol, 12 sessions: perception and symptoms did not follow real exposure, except for one volunteer, whose perception mostly matched it and whose symptoms were borderline; for half, symptoms followed perceived exposure [5]. At home: none of 42 identified personalized exposure better than chance [28]; over 21 days, significant correlations in 4 of 7 participants, 2 positive and 2 negative, with peaks and rate of change, none with the average [33]	Each person's own sources, at home, over time
Sleep	Pulse-modulated 900 MHz before sleep increased spindle-range EEG power after 14 Hz modulation at 2 W/kg peak spatial SAR [8]; a repeat-exposure study with 2 Hz pulses found delta-theta but no spindle change, and no reproducible within-subject effect [9]. 397 residents, 12 nights, double-blind base station: no difference [34]	Night-long logging; people with impaired sleep
Pregnancy, children	83,884 mother-child pairs: hyperactivity or inattention OR 1.28 (1.12-1.48) with high self-reported phone use [26]. 913 women with a 24-h meter: miscarriage aHR 2.72 (1.42-5.19) among 453 measured on a typical day [29] (Expression of Concern)	Measured exposure, not recall
Reproduction, co-exposure	1,492 samples: sperm motility 8.1 percentage points lower (-13.1 to -3.2) [11]. Animals: reduced pregnancy rate after male exposure, moderate certainty, mostly above human levels [35]‡. RF from day 6 of gestation, with a carcinogen on day 14: more lung tumors at 4.8 W/m² [31]; a replication at 0.04, 0.4 and 2 W/kg found more lung and liver tumors and lymphomas, with no clear dose-response [10]	Carry position; full dosimetry
[Q11(c)] **Older adults**	Occupational ELF and Alzheimer's disease: RR 1.63 (1.35-1.96), heterogeneous, with indication of publication bias [36]. 15 years or more within 50 m of a 220-380 kV line: Alzheimer's mortality HR 2.00 (1.21-3.33) [37]	Time in bed; implants; distance to lines
[Q11(d)] **Cardiac implants**	Device interference is outside ICNIRP's scope [7]; immunity is tested to ISO 14117:2019, 0 Hz to 3 GHz [38]. FDA engineers measured fields above the 10 gauss that can trigger magnet mode at 1 to 11 mm from iPhone 12 and Apple Watch 6 models [39]. Limit values for these patients cannot yet be derived [40]	Interference distances; static fields
[Q13(j)] **Wireless medical devices**	MedRadio bands 401-406, 413-419, 426-432, 438-444 and 451-457 MHz, and 2,360-2,400 MHz; implant and body-worn transmitters fall under the portable-device SAR rule [41]	Share of cumulative exposure

‡ Commissioned by WHO (stated); noted, not downgraded.

F1. Well established: EHS symptoms are real, can be disabling and are nonspecific [1,24]. **F2. Open:** a reacting minority and delayed responses, with selection bias in 82% of 28 provocation studies [6,33]; a reported change in sleep EEG at the ICNIRP local limit, while blinded field studies find no change in sleep quality [8,9,34]; and amplification of other harms. WHO-commissioned observational reviews rate their evidence low or very low certainty [12,13], the experimental review of symptoms rates its null findings mostly high or moderate certainty [4], and ICBE-EMF authors argue that the reviews provide no assurance of safety [14]. **F3. Limited:** biomarkers, from series without concurrent controls [42].

5 WHAT EFEIA CAN CONTRIBUTE [Q4(l)]

Instruments. Questionnaire A records technology use and proximity, night-time device practices, screen time, time in nature, hydration, nutrition and sensory sensitivities; B rates 25 symptoms, such as fatigue, insomnia and headache, 0 to 10 each (maximum 250), and the Census report states that "the total score is indicative" [19,32]. B's scale and the forms of A must be fixed before national use, and neither has been validated [15,32].

Table 2. EFEIA field observations (grade b), kept apart from the hypotheses they raise.

Observation	Hypothesis raised	Test needed
NOXTAK field history (organizational account): thousands reporting electrosensitivity and thousands of encounters in which psychological or contextual factors contributed [15]	Both coexist and need equal documentation	Census of people with and without concerns (P6)
2014-2018 series of 357, uncontrolled, concurrent interventions [16]	Expectation shapes some reports	Blinded designs (R3)
Census, 94 completing three questionnaires: symptoms correlate with sleep disruption (r = 0.638) and sensitivities beyond EMF (r = 0.465) more than with exposure habits (r = 0.413) [18]	Sleep and wider intolerance are part of the picture	Cohort with measured bedroom exposure (R2)

[Q3, Q4] **Table 3.** Questions 3(a) to 3(g) and 4(h) to 4(m), in aggregate only, because comments become public.

Item	Aggregate answer
3(a), 3(b)	43.8% of 283 keep the phone active at bedtime and 37.8% charge it at or near the bed at least sometimes [19]
3(c), 4(h) Effects	Highest mean severity among 141: fatigue 5.94 of 10, concentration problems 5.15, nervousness 5.13, insomnia 5.08 [32]
3(d) to 3(f)	Onset, evaluation and steps not collected; 67 of 113 report sleep problems for over six months and 13 use sleeping pills [43]; the 2014-2018 series, which evaluated a NOXTAK product, is in Section 5 [16]
3(g), 4(j)	Exhibits 3A and 3B; Census reports [18,19,32,43]. 286 enrolled, more than 20 countries; of 94 completers, mean age 44.2 years, 69 female and 80 Spanish-speaking [18]
4(i), 4(k) to 4(m)	Onset: row 3(d); patterns: Table 2; methods: A and B, not validated (R5); recommendations: Parts 6, 7

Not in this submission: the Census raw data. **Relationship:** EFEIA operates within the NOXTAK ecosystem, which develops SPIRO; the 2014-2018 series evaluated SPIRO, and its first author is NOXTAK's founder and CTO [16].

6 ADDITIONAL RESEARCH NEEDED [Q4(m), Q5(o), Q16]

[Q9, Q17(b), Q17(c)] **R1. Clinical guidance** from NIEHS and CDC on assessment, differential diagnosis, care and accommodation of the whole person [23,24]. [Q10(d), Q17(b)] **R2. A long-term cohort** of phenotyped participants followed beyond one year [24], with home logging of RF, 50/60 Hz and 2-150 kHz fields, peaks as well as averages [33,44,45]. **R3. Blinded trials at home** switching each person's own sources, timed for delayed responses [5,6,28], including night-time trials in people with insomnia, ADHD or IEI-EMF [8,34]. [Q10(e)] **R4. Biomonitoring:** no biomarker of RF or ELF exposure is validated; candidates should be measured blind, with controls, inside measured-exposure cohorts [42]. **R5. Validation of A and B** in English and Spanish, and of teenager and autism-accessible versions [15]. [Q10(f), Q17(a)] **R6. A federal intake** pairing case reports with measured exposure and clinical assessment; FDA states that MAUDE reports cannot establish incidence [46]. **R7. Co-exposure and reproduction:** an NTP-standard replication of the carcinogen design at 0.04 to 2 W/kg [10,31], and semen and pregnancy cohorts with measured exposure and shareable data [11,29]. [Q10(a)] **R8. Registries:** SEER showed glioma incidence in U.S. non-Hispanic white adults generally constant from 1992 to 2008 [47], but registries hold no exposure data; linking cases to residential, occupational and device histories would make them informative. [Q10(g)] **R9. Clusters:** linking a pattern to a cause is difficult [48]; assessments involving transmitters or power lines should include calibrated RF and ELF measurement.

7 PROPOSAL AND NEXT STEPS [Q5(n), Q16, Q17]

[Q17(b), Q17(c)] **P1. Sponsor and schedule.** HHS, through OASH, convenes and funds a voluntary National Program for the Characterization of Electromagnetic Hypersensitivity through EFEIA's National Census Plan, with

universities and community partners; NIEHS supports the protocol and analysis, and CDC advises on case definition and survey methods. Preparation months 1-6, collection 7-18, analysis and first national report 19-24 [15].

P2. Two questionnaires only. A and B, linked per participant; the protocol's other forms, measurements and clinical review are separate follow-up, and taking part never requires a purchase [15]. **P3. Scoring control.** One version of each form, scored separately, with no combined diagnostic total [15]. **P4. Clinical use requires validation.** An A-B profile can select participants for measured-exposure studies; before any clinical screening use, reliability, sensitivity and specificity must be shown against a reference standard defined in advance, reported to STARD 2015 [1,49]. **[Q11(a)]** **P5. Teenager and autism-accessible versions** with plain language, supported communication, guardian permission and assent, and no adult cutoffs transferred without validation [15]. **P6. Recruitment** online, on paper and by telephone, in English and Spanish, including people without concerns about exposure; identifiers held apart, small cells suppressed [15]. **P7. Independence:** independent review, the NOXTAK relationship disclosed, and evaluation of screening, not of products [15].

[Q17(b)] **P8.** NTP and NIEHS evaluate the co-exposure replication (R7). **[Q10(d), Q17(b)]** **P9.** The NIH ECHO Program, which expects to follow about 60,000 children through 2030, pilots an RF and ELF measurement module [50]. **[Q17(a), Q17(b)]** **P10.** NIEHS and FDA CDRH prepare an HHS synthesis of non-cancer endpoints, weighing WHO-commissioned reviews against critiques [12-14]. **[Q10(a), Q10(g), Q17(c)]** **P11.** CDC, with NCI's SEER program, pilots registry linkage and adds measurement to cluster assessments (R8, R9). **[Q11(c), Q11(d), Q17(a)]** **P12.** FDA CDRH publishes interference distances by implant type, and HHS guidance names older adults and people with implants as groups to assess separately [38-40].

Related: Sections 1 (instrumentation), 2 (urban electromagnetic monitoring), 5 (ecosystems and a passive candidate solution) and 6 (what the limits assume).

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