The Essex Study – Statistical Analysis (Dr Grahame Blackwell 01/08/07)

This analysis is compiled with reference to the paper "*Does Short-Term Exposure to Mobile Phone Base Station Signals Increase Symptoms in Individuals who Report Sensitivity to Electromagnetic Fields? A Double-Blind Randomised Provocation Study*", as published by the Essex research team in 'Environmental Health Perspectives' (free download available here).

Summary

- There are tens of thousands of people in the UK who are unusually sensitive to non-ionising electromagnetic radiation. Their condition is universally recognised by the medical profession and the public. Those people are usually fair-skinned and red-haired, the radiation they are sensitive to is ordinary sunlight.. To force those people to spend their lives in bright sunlight or to require them to prove their condition by repeatedly exposing themselves to it until they were made ill would rightly be considered barbaric.

- There is another group of people that believe themselves to be sensitive to non-ionising electromagnetic radiation – a belief supported by official responses in some other countries. These people are called 'electrosensitives'. This radiation is invisible – it's the frequencies used by mobile phones, phone masts and WiFi. Unlike sunlight, we haven't had millions of years of evolution to adapt to it; unlike sunlight, there's nowhere you can hide from it. Unlike those who are sensitive to sunlight, electrosensitives are required to prove their sensitivity by volunteering to expose themselves to radiation until they're ill – and still they're not believed.

- Fifty-six ES volunteers started on the Essex study trials. Twelve had to drop out partway through. According to information released by the Essex team, five of those were due to ill-health associated with the study and two others failed to turn up for subsequent sessions after the first. Given the trouble that electrosensitives had gone to to get on this study and get to the first session, it's a fair assumption that the no-shows dropped out due to discomforting experiences in the first session. If we attribute just **one** of those two 'dropouts' to that, this works out as a clear ten percent reduction in the ES group due to adverse effects from the first session.

The same follow-up information release states that a symptom count and analysis of symptoms for that first session comes out the same whether or not the twelve dropouts are included. However the study schedule (Table 1) indicates that that first session **only** included collection of symptom data in the 'Open Provocation' session - i.e. when all participants **knew** whether or not they were being exposed to emissions. It's agreed by all concerned that the open session is not a good indicator of genuine response to emissions - particularly since those who mistakenly believe themselves to be ES (of which there are bound to be some in the ES group) are likely to artificially inflate symptom figures. For this reason a comparison of symptom scores, with and without the twelve, is likely to result in 'throwing out a significant part of the baby whilst keeping the bathwater' - to use a crude analogy.

The only other data collected in that first session was from three rapid-fire exposures of five minutes each, separated by two-minute 'wash-out' periods, to see whether candidates could tell whether the mast was on and, if so, what type of signal was being emitted. Given that this was preceded by a highly stressful journey for many (see below) and 30 minutes of actual exposure in the Open Provocation session, 'washed out' would seem to be an appropriate phrase. Certainly this level of data inclusion doesn't do justice to that 10% who, despite suggestions to the contrary, may well have been the most sensitive volunteers and who suffered physically in their attempt to prove their case (including, in at least one case, internal bleeding). Elimination of the 10% of the ES sample that had experienced severe physical reactions, whilst retaining those few who erroneously considered themselves ES, arguably constitutes a 'top-slicing' and dilution that dramatically reduces any chances of finding an effect. Whether or not that **is** the case is open to question - but it **is** a question that hangs in the air, unanswered, and challenges the overly definitive conclusion presented to this study.

• [The Essex study used simulated GSM and UMTS radiation. A genuine GSM traffic (voice) transmission includes an 'idle' frame every 120 milliseconds , effectively giving an ELF (Extremely Low Frequency) pulsing at 8.33 Hz (cycles per second). It's ELF pulsing that's potentially the most harmful part of this type of radiation. The Essex simulation used a statistical process to simulate GSM radiation; no mention is made of any 'idle' frames. Without those idle frames there's no pulsing, electrosensitives are far less likely to feel any effect (because it's not a GSM signal).]

Since posting this observation I've been advised that the Essex GSM simulation was amended to include the idle slots - so those idle slots **were** present for these trials. The question then becomes: given that it had been made clear that the 8.33 Hz pulsing was a crucial feature of GSM, why did the Essex paper clearly state *"changes in the power level of the traffic channels were simulated using two first order, two state Markov processes, assuming a blockage rate of 1% and call activity of 40%"* - with no reference to the fact that those power levels were **also** modulated by an idle frame every 120 milliseconds?

• A number of the ES participants had to travel some distance to the trials, subject to mast & phone radiation as well as possibly strong electromagnetic fields in tube tunnels (sparking rails, cables). By the time they got there, they were already 'masted out'. As one participant described it: "It's like being led through a smoke-filled room, sat down and then asked 'Now, can you tell, has anyone just lit up?'"

• Despite this, (and despite this sample group only being 1/3 the size properly needed to detect significant effects – paper, p.10), statistical analysis **did** show that the ES volunteers **did** have a highly significantly stronger reaction to UMTS signals than the controls. This led to further analysis, which showed that almost half of the ES group were allocated their UMTS exposure (randomly by computer) in the first long session. [Given that researchers must be totally even-handed about the outcome, this begs the question: would there have been 'further analysis' if the results had **not** proved significant?]

The research team then reasoned that ESs would be "*more anxious*" in the first long session, but in subsequent sessions they "*knew what to expect and were overall less anxious*." It's worth noting first that 'anxiety', although listed, was **not** the response that showed up as 'highly significant' for ES participants under UMTS exposure. More importantly, the Essex study team's reasoning doesn't actually appear to make sense. If those ES participants experienced strong reactions in that first session, why on earth would they feel *more relaxed* in subsequent sessions once they knew what to expect?? The experiences described by one of those participants (bottom of this report) indicate exactly the opposite.

- The data was then analysed session-by-session, just for UMTS v. Sham exposure. One consequence of this was to reduce the ES group sizes (already small) to very small numbers. The likelihood of a statistical test detecting a significant effect is directly related to the number in the sample – which is why a test like this needs a decent sized sample to prove anything conclusively. The sample size needed to detect an effect, documented on p.10 of the report, is 132 – but in this 'afterthought' test we're down to less than a quarter of that number (32), with just 12 in the sham exposure, for the first long session – and an even smaller average ES group size (28) for the other two sessions. The chances of detecting an effect with such group sizes is considerably less.

- And so, of course, no effect was detected. Hardly surprising.

- What **is** surprising is that this 'post hoc rationalisation' analysis was used as the basis for the conclusion of this study, namely that *"IEI-EMF individuals* [electrosensitives] *are unable to detect the presence of rf-emf under double-blind conditions"* and *"short-term rf-emf exposure from mobile phone technology is not related to levels of well-being or physical symptoms in IEI-EMF individuals."*

  One would expect that the result of the original analysis - a highly significant effect shown for electrosensitives - would be recorded as the primary finding, with the observed 'confounding factor' recorded as a possible explanation for that result. A further study would then be required to test whether or not that 'confounding factor' was in fact responsible for that result.

  [As a footnote, it's worth noting that the significant effect detected from UMTS emissions is totally in agreement with the findings of Zwamborn e al, 2003 (The TNO study)]

- Under the circumstances, the claim in the Essex Press Release that
  *"**Study finds health symptoms aren't linked to mast emissions**."*
  is open to serious question.

First-Day Experiences of One Electrosensitive Participant

Read this lady's own unedited email account of the first day's testing, then explain to me how it could be that people like her were less anxious in subsequent sessions as they knew what to expect.

[Note that she cannot spend long at a computer without being affected]

1. I did not drop out of the Essex Study.

2. I will ask my husband to e'mail a copy of my results, I detected the mast when it was ON correctly.

I felt very sick, nauseous, heavy pressure in my head it was very painful, I felt my face burning, tingling over my arms and legs,an uncomfortable feeling all over my body, when the test was over I felt as if i was going to faint. I was going to be sick and the lady at Essex she said, no no here, this material is very expensive, I will get you a paper bin, she told me that the blue material that surrended the lab was there to absorb the sound that the mast produces and it was very expensive. As I walked out of the testing lab to meet my husband he was waiting for me in the car, he took me to essex the first time, i could not stand the outside light, i had to shut my eyes, in the car i felt pain in my eyes as if the wind had blown sand on them, they hurt, my husbant told me that my eyes were very red and that my cappilaries were swollen, I look at them in the mirror and my eyes were like i had conjunctivitis.

All the way home I felt very ill, heavy, in pain , I arrived home and my eyes were very sore when I closed them i could see two very bright circles inside,something tike if i had a lightbulb in each one, i went to bed and felt as i was coming down with the flue, I very weak the following day i could not get up, i felt exausted, in a lot of pain. Essex university rang up to ask how i felt, the following week i was due to go for the secind testing that i had to cancelled it i was going to pull out, my family insisted i was to carry on because whith my results of those tests i could get rid of the mast near our house i could prove to the government that the mast emissions affect my health. I did not want to carry on because of the pain involved in the testing, but i new i had to continue if i wanted to save my children from getting ill from the radiation of the vodafone mast near our house.

when i told essex i was too weak to carry on they told me to come back the following week, so i had an extra week to get better and also offered to pay hotel accomodation for the rest of the tests.

I am beginning to feel very ill, i will have to continue another time,