ITU Workshop on “Human Exposure to Electromagnetic Fields (EMFs)”

(Quito, Ecuador, 14 August 2013)

Exposure levels and good practice EMF policies for mobile networks

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Growing demand for mobile data

Data traffic volumes doubled between Q1 2012 and Q1 2013, and are expected to grow 12-fold by 2018
More use of internet and more use indoors

120x more data than feature phone

79% indoor usage

Quito, Ecuador, 14 August 2013

OFCOM, 2012; ITU, 2012
Evolution of mobile technologies

Source: Ericsson (June 2013)

Mobile subscriptions (million)

- LTE
- WCDMA/HSPA
- GSM/EDGE-only
- TD-SCDMA
- CDMA
- Other


today

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Ericsson Mobility Report, June 2013
Exposure reduces rapidly as distance increases.

- Public limit
- Worker limit
- Small fraction of limit
RF exposure evaluation

- Near to antennas:
  - Compliance zones.
  - Access controls.

- Far from antennas:
  - Very low exposures.
  - Communication.
Antennas not accessible

Simplified evaluation.
Compliance boundaries

- Assess zones.
- Manage access.
- Signage.

Compliance Boundary Public
Compliance Boundary Worker

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Environmental levels from mobile network antenna sites

ORIGINAL ARTICLE

Comparative international analysis of radiofrequency exposure surveys of mobile communication radio base stations

Jack T. Rowley¹ and Ken H. Joyner²

http://dx.doi.org/10.1038/jes.2012.13
Exposure similar for all countries

Global average more than 5,500 times below limit values.

Based on Rowley and Joyner, 2012
Similar exposures regardless of mobile technology

Current results show LTE similar to other technologies.

Based on Rowley and Joyner, 2012
Time trends – 5 countries

No significant change in RF exposure since introduction of 3G

Based on Rowley and Joyner, 2012
Exposures similar from different site types

Adapted from Figure 2 of Bornkessel et al, 2007

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Small daily variation in radio signal levels

Small variation due to traffic activity.

Sample audit measurements to build trust.

Benefits of fixed monitors not independently evaluated.

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Joseph et al, BEMS, June 2010
Mobile network exposure levels similar to other radio sources

Based on Valberg et al., 2007.
Antenna siting challenges

- Spectrum and antenna sites needed to address growing traffic and bridge digital divide.

- Difficulties with local authority approvals due to concerns about health, visual intrusion, proliferation of masts.

- Countries need a national approach to facilitate deployment of antennas.

‘You need to quadruple the number of antennas to deliver 4G Internet’
- Peru, Deputy Minister of Communications, July 2013.
National policy for mobile networks

- Consistent policy protects public and supports rollout.
  - Clear criteria for site assessment with health concerns addressed by national limits based on WHO recommendations.
  - Support municipalities through policy that specifies:
    - Information, consultation and visual integration requirements.
    - Mandatory decision period for site applications.
    - Simplified procedures for small antennas, low power sites and modifications.
    - Non-political decision making.
- Allow site sharing where technically and commercially feasible.
- Grant access to government buildings and land for antennas.

quito, ecuador, 14 august 2013
Some US initiatives on antenna siting

- Federal working group addressing access to government facilities.

  - 90 days - co-location, 150 days - other.

- “Colocation by right”.
  - ‘...local government may not deny, and shall approve...modification...’

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Conclusions and Recommendations

- Exposure levels from mobile network antennas typically very low:
  - Unless very close to the antennas.

- Adopt evidence based RF policy harmonised with international limits

- Adopt national policy for deployment of mobile network infrastructure.
Muchas Gracias

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Wireless safety review expert quits amid conflict of interest claims, High Court clears mobile tower safety, bed science reporting increases perceived sensitivity to EMF, illnesses blamed on inactive 4G antennas, walkers overtake drivers in mobile related injuries and e-waste effects on kids studied.

Illnesses blamed on 4G antennas that weren’t turned on
Two well-known anti-wireless campaigners have said radiation from nine rooftop 4G network antennas was making them sick despite ...
More ...

Poor journalism makes Brits worried sick about wireless signals
Inaccurate UK newspaper reports about people who claim to be sensitive to wireless signals has likely led ...
More ...

July News Roundup

Indian High Court rules no evidence of harmful effects from mobile towers
More walkers than drivers injured while using mobiles in the US
Expert steps down from safety standard review amid conflict of interest claims
WHO investigate impact of backyard e-waste recycling on children’s health
Mobile phone use not linked to increased skin cancer risk

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Background Slides
Phones need nearby antenna sites

- Low power devices.
- Adaptive power control.
- Battery life.
- Avoid interference.
Ground level distance does not predict exposure

For example, at 100 m, the measured levels differ by more than 1,000 times.

USA – improving access to federal lands

- Creation of federal working group to address broadband deployment access issues for government lands, buildings, and rights-of-way.
- Intent is to give carriers a single approach to leasing federal assets for broadband deployment.
- US government controls nearly 30% of land, thousands of miles of roads, and more than 10,000 buildings
USA – “shot clock” & “colocation by right”

  - Reasonable time for communities to process an application.
  - Decision in 90 days for co-location, 150 days for other applications.

- Middle Class Tax Relief and Job Creation Act (Feb 2012)
  - section 6409(a) – “colocation by right”.
  - “a state or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station.”
  - Substantial = 10% or up to about 6 m plus other criteria.
Planning exclusion zone policies are unworkable

- Arbitrary distances.
- Political response.
- GSMA supported hypothetical analysis based on Melbourne (Australia).
- If 500 m zone applied:
  - across whole urban area would affect >50% of antennas.
  - rises to 90% in dense urban area.
Visual integration with the environment

- Design to be compatible with environment.
  - Colour.
  - Integration.
  - Screening.
  - Public art.

- Some people fear ‘camouflage’.

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Integration does not mean invisible
The number of visible base stations does not significantly influence RF exposure level.