

Evaluation of RF general population exposure- a pilot study in France (Besançon, Lyon)



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Evaluation of RF general population exposure

▼ *Objectives*

- Characterise RF exposure levels on a general population basis
- Evaluate the importance of different exposure sources in our general and personal environment
- Identify, if possible, the main factors which may predict exposure levels

▼ *Design*

- Population based survey – pilot study
 - Only 10 RF exposure meters and short time period

... cannot provide a full assessment / mapping of exposures in the French population



Evaluation of RF general population exposure

- ▼ Two complementary study regions
 - Besançon
 - 120 000 inhabitants;
 - no UMTS;
 - immediately surrounded by rural areas from which many workers commute daily (by train or car)
 - Density of RF sources much less than Lyon
 - Lyon
 - Much more densely populated - 1 200 000 habitants
 - Very large urban area
 - With subway and tramway
 - UMTS being deployed
 - Much greater density of RF sources

... allow the study of urban/rural contrasts, density of population, public/individual transportation means



Evaluation of RF general population exposure

▼ Design

- Study period
 - Test period – June-August
 - Field work
 - ✓ from September 2005 – once authorisation from ethical review and institutional review boards
 - ✓ 20 weeks
- Number of samples
 - 24 hour measurements – 400 (200 per city)
 - 1 week measurements – 40 (20 per city)
- Stratified sample
 - Urban/rural ratio: 75% / 25%
 - Age: Children (12 years or more), students, adults



Evaluation of RF general population exposure

▼ Organisation

- Subjects chosen at random
- Contacted to
 - Inform about the study
 - Enquire about whether appropriate person in the household (children, students, etc.)
 - Enquire about willingness to participate (informed consent)
- Measurement protocol
 - RF exposure meter and a brief questionnaire and diary will be delivered to participants
 - Use of meter and diary will be explained
 - Exposure meter and documents will be collected 24 hours (1 week) later
 - Information will be downloaded from the exposure meters
 - Exposure meters reset and battery charged



Evaluation of RF general population exposure

▼ Data available for analysis

- Exposure meter recordings
- Questionnaire about occupation and general habits
- Diary (by 15 minutes over the monitoring period) indicating location of subject, moving/stationary, use of mobile phone, etc.
- Position of base stations and radio and television emitters – using GIS coordinates of participants' homes and workplaces



Evaluation of RF general population exposure

▼ Data analyses

- Geographical analyses:
crude map of exposures in Besançon and Lyon.
- Multivariate regression analyses:
to determine the effects, on the measured exposures of:
 - location of individual with respect to RF sources (at home and at work)
 - Means of transport
 - Use of mobile phones and microwave ovens

▼ Outcome

- Assistance in planning of new, better targeted exposure assessment studies
- Assistance in characterisation of exposure distributions for the planning and feasibility assessment of analytical epidemiological studies