

PUBLIC HEALTH RESEARCH - THE NEED FOR NEW APPROACHES IN COMPLEX EMF-ENVIRONMENTS

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Complex EMF-Environments

Electric Fields



Magnetic Fields



EM Fields



Problem

- ◆ Classical environmental epidemiology has focused mainly on single risk factors. This approach is justified when the risk factor under study is not surrounded by other risk factors of similar effect estimates with respect to the endpoint.
- ◆ However our environments are becoming more and more complex with respect to various environmental risk factors. Especially human exposure to microwave radiation from mobile & cordless phones and their base-stations, wireless wide, local, personal area network etc. (WAN, LAN, PAN) is on the rise and epidemiological research in this areas is still at the beginning. Further examples are exposures to electric and magnetic fields in the ELF- and kHz-range from electric wiring and electrical appliances.
- ◆ The situation of complex exposures may lead to non differential exposure misclassification and to reduced and even severely diluted effect estimates. Public Health needs reliable answers on risk factors.

Key Measures for Improvement

- ◆ There is a need for better exposure assessment in future epidemiological studies
 - ◆ taking the various risk factors,
 - ◆ the different places of exposure (at home, at work etc.)
 - ◆ and the various time courses of exposure into account.
- ◆ This has to be analysed by multivariate statistical methods.

Key Measures for Improvement

The Exposure Matrix

| Long term Exposure: <u>At home</u> | 2003 | 2004 | 2005 | 2006 | La-tency Years | Exp-hours | Cumm. Dose |
|--|---|--|---|---|----------------|-----------|--|
| Mobile Phone mean number calls x duration (min) per year | 10x3min x 365d= 10950min =182,5h | 10x3min x 365d= 10950min =182,5h | 10x3min x 365d= 10950min =182,5h | 10x3min x 365d= 10950min =182,5h | 4 | 730 | |
| Mobile Phone Base Station A sum BCCH GSM bed at night peak detector max hold | 12h x 365d =4380h x 1,4 mW/m² = 6132mW/m².h | 12h x 365d =4380h x 1,4 mW/m² = 6132mW/m².h | 12h x 365d =4380h x 2,8 mW/m² = 12264mW/m².h | 12h x 365d =4380h x 2,8 mW/m² = 12264mW/m².h | 4 | 17520 | <u>36,8W/m².h</u> |
| Mobile Phone Base Station B sum all CPICH UMTS bed at night peak detector max hold / rms detector max hold | - | 12h x 365d =4380h x 1,4 mW/m² = 6132mW/m².h /0,14mW/m²= 613mW/m².h | 12h x 365d =4380h x 1,4 mW/m² = 6132mW/m².h / 0,14mW/m²= 613mW/m².h | 12h x 365d =4380h x 1,4 mW/m² = 6132mW/m².h / 0,14mW/m²= 613mW/m².h | 3 | 13140 | <u>18,4W/m².h</u> <u>1,84W/m².h</u> |
| Cordless Phone | - | - | - | - | - | - | - |
| Cordless Phone Base Stations | - | - | - | - | - | - | - |