

Short report on the seminar on statistics of the FGF on February 27, 2008

How much power do statistics and epidemiology have?

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A one-day seminar on the topic „Statistics and Epidemiology“ took place in Munich in February 2008, due to the wish of several FGF members to obtain detailed and competent background information about epidemiological studies and the underlying statistics.

The chair of the seminar was Dr. Hagen Scherb from the Institute of Biomathematics and Biometry at the Helmholtz Center Munich. The interest of the attendees was focused on the parts of the INTERPHONE study that are already published and the overall result that is expected in the near future.


Also the so-called „Oberfeld study“ was included in the programme of the conference, an epidemiological study on the cancer incidence around an (assumed) mobile communication mast (C network, NMT 450 Standard) recently published on the internet.

Thus, the seminar was divided into the areas: „Introduction to statistics for biological studies“, „Statistics in epidemiology“ and „Special aspects regarding the INTERPHONE study“.

The INTERPHONE study

A statistical term whom was given high priority over a large part of the seminar was „power“ - the variable that expresses the reliability of the results of a study and strongly depends on the number of participants

resp. studied subjects. Their low number in most of the single studies of the INTERPHONE project, which, taken alone, gives them low significance, were thoroughly discussed and criticized. But for a meta-analysis of all single studies of INTERPHONE the statistical power should be sufficient, even for assumed increases of the cancer risk (of less than 1.5). The data from the studies already published were used by Scherb to perform a preliminary meta-analysis of some of the examined cancer types. A „protective“ effect (in the sense of health protection) of regular mobile phone use compared to non-users or rare users was shown. But Scherb thinks that this is an effect of the increased inclusion of mobile phone users in the group of controls, which unintentionally leads to an overweighting of healthy mobile phone users (participation bias). When thinking this further and subtracting the „protective“ effect, one obtains an increased cancer risk for long-time users that is usually not visible. However, this is a preliminary assessment which has still to be confirmed by an expected meta-analysis with an assessment of dose-related effects of the



entire INTERPHONE results. This and other methodological weaknesses (like e.g. regarding exposure assessment) lead to the expectation that the conclusiveness of the INTERPHONE project will be assessed as limited.



The „Oberfeld“ study

The „Environmental-epidemiological study of cancer incidence in the municipalities of Hausmannstätten and Vasoldsberg“ had made the headlines shortly before the event, because of its seemingly unrealistic exposure assessment. However this fact was not a topic of the seminar, but the statistics and methodology of the study. It was seen as unusual that the participants were requested to report in a questionnaire whether they were a „case“ (suffering from cancer) or „control“ (non-cancer). The danger of a bias arises in the sense that concerned people living near the base station have a substantially different health perception and readiness to participate in research than persons living at a distance, who possibly give lower relevance to the base station (hazard potential). This probable bias is also expressed in the fact that significant more participants (persons who responded to the questionnaire: 5.3%) are living in the proximity of the base station (at a distance of less than 200 m) than non-participants (persons who did not respond, but were determined by the registration office: 2.7%). The rest - 94.7% resp. 97.3% - are living beyond the 200 m radius around the base station. Moreover, two samples were compared, one sample (persons who responded to the questionnaire) being a subset of the other (persons who responded to the questionnaire + registered non-responders). This makes a comparison illogical. The result of this preliminary evaluation was that the strength of evidence of the study has to be seen as speculative - regardless whether there

was a transmitting mobile communication antenna in the study period at all or not.

First comments of the twenty attendees of the seminar show that this event was necessary and (at least for the most) has brought a real growth of knowledge and some „aha“ experiences. Particularly, it became clear that a study's statistics is always worth to be checked. The wealth of information to be communicated and the differences in knowledge among the attendees make it reasonable that such seminars should be extended to at least two days, resp. that instruction should be target-group-specific. There is also agreement on the fact that, in view of the relevance of epidemiological studies resp. the correct evaluation of statistical data in risk communication such events should be organized more often.

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