TS4-03 RECALL ERROR AND BIAS IN EPIDEMIOLOGIC STUDIES OF MOBILE PHONE USE AND CANCER RISK

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Exposure assessments in most case-control studies of mobile phone use and cancer have relied on participants' self-reports of phone use, as it is usually impossible to obtain long-term independent records of phone use. Very few studies however, have attempted to validate self-reported phone use. Extensive validation studies were carried out as part of INTERPHONE, the international case-control study of mobile telephone use and risk of brain tumour, to validate phone use reported through standardised personal interviews. Further, simulation studies were carried out to investigate the potential impact of recall errors on tumour risk estimates.

In volunteer validation studies, mobile phone use of 672 volunteers in 11 countries was recorded by operators or through the use of software modified phones, and compared to use recalled 6 months later using the INTERPHONE study questionnaire. On average, volunteers underestimated the number of calls per month (geometric mean ratio of recalled to actual use=0.92, 95%CI=0.85-0.99), whereas duration of calls was overestimated (geometric mean ratio=1.42, 95%CI=1.29-1.56). Inter-individual variation was large, and increased with level of use. The studies concluded that volunteer subjects recalled their recent phone use with moderate systematic error and substantial random error. Further validation studies were carried out to address questions regarding long-term recall errors and differences in recall between INTERPHONE cases and controls; these studies were limited to the few countries where it was possible to collect long-term billing records for cases and controls, but they give important additional information to the short-term volunteer studies.

The impact of recall errors on tumour risk estimates was then assessed through Monte-Carlo simulations based on existing INTERPHONE data. Recall error scenarios simulated plausible values (based on the validation studies) of random and systematic, non-differential and differential recall errors in amount of mobile phone use. These simulation studies showed that when random errors were large (of the level found in these validation studies) they had a large impact biasing risk estimates for continuous exposure towards a null effect. Further, random errors had a larger impact on the risk estimates than did systematic errors, even when relatively extreme systematic errors were modelled and when the systematic errors simulated differed between cases and controls.

The results of these validation and simulation studies will play an important role in the interpretation of existing and future case-control studies of mobile phone use and cancer risk, including the INTERPHONE study.