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### Source of Funding and Results of Studies of Health Effects of Mobile Phone Use: Systematic Review of Experimental Studies

### Source de Financement et Résultats des Etudes sur les Effets sur la Santé du Téléphone Mobile : Revue systématique des Etudes Expérimentales

#### Introduction:

Over the last decade, the use of mobile phones has increased rapidly. Mobile phones emit low-level radiofrequency electromagnetic fields. The absorption of radiation by the brain of users of handheld phones has raised concerns regarding potential health effects, but studies on this issue have produced conflicting results. Many of the relevant studies have been funded by the telecommunications industry and thus may have resulted in conflicts of interest. We performed a systematic review and analysis of the literature to examine whether industry involvement is associated with the results and methodological quality of studies.

#### Methods:

We searched EMBASE, Medline, and the specialist database ELMAR in February 2005 and scrutinized reference lists from relevant publications. We included original articles that reported studies of the effect of controlled exposure with radiofrequency radiation from mobile phones on health related outcomes. Health related outcomes included e.g. electroencephalogram recordings, cognitive or cardiovascular function or subjective wellbeing and symptoms. Of all studies, methodological and reporting quality was assessed, as well as data on the source of funding and the reporting of potential conflicts of interest. The primary outcome was the reporting of at least one statistically significant association between radiofrequency exposure and a health related outcome. In September 2009, we updated our literature search in EMBASE, Medline, ELMAR and the EMF-Portal, and assessed sources of funding and the reporting of potential conflicts of interest statements in the publications.

#### Results:

We identified 59 studies in the first search (see Table 1). None of the 31 journals published a conflicts of interest statement. Studies with mixed funding had the highest study quality whereas studies with no reported source of funding did worst. Studies funded exclusively by industry reported on the largest number of outcomes but were less likely to report statistically significant results. This finding was not altered in analyses where we adjusted for the number or categories of reported outcomes, study design and quality or exposure characteristics.

In the update of the systematic literature search between February 2005 and October 2009, we identified 75 studies (Table 1). The percentage of studies that did not report on source of funding had declined slightly, whereas there were now more studies of mixed funding. 8 of 75 (11%) publications reported a conflicts of interest statement that reported that there were no conflicts. Of these 1 had industry funding, 2 had mixed, 4 had public funding and 1 did not report their funding source. Of the 7 publications that had authors with industry affiliation, none reported on potential conflicts of interest.

	Industry	Public	Mixed	Not reported	Total
Systematic review until Feb. 2005	12 (20%)	14 (19%)	11 (24%)	22 (37%)	59 (100%)
Feb. 2005 – Oct 2009	11 (15%)	12 (16%)	33 (44%)	19 (25%)	75 (100%)
Total	23	26	44	41	135

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(17%)	(19%)	(33%)	31%	(100%)
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Table 1: Reported sources of funding in studies on health effects from mobile phone use

**Conclusion:**

Our first systematic review found that source of funding explained some of the heterogeneity in the results of different studies, and the results supported the notion that disclosure statements should be published, including statements indicating the absence of conflicts of interest. However, these are rarely reported.

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