

Interphone study reports on mobile phone use and brain cancer risk

STRICT EMBARGO UNTIL 18 MAY 2010 - 1:30AM, Paris time

The Interphone Study Group today published their results¹ in the *International Journal of Epidemiology* ([direct media link](#)). The paper presents the results of analyses of brain tumour (glioma and meningioma) risk in relation to mobile phone use in all Interphone study centres combined. This interview-based case-control study, which included 2708 glioma and 2409 meningioma cases and matched controls was conducted in 13 countries using a common protocol. Analyses of brain tumours in relation to mobile phone use have been reported from a number of cohort and case-control studies, including several of the national components of Interphone. No studies, however, have included as many exposed cases, particularly long-term and heavy users of mobile phones, as this study.

Background

Mobile phone use has increased dramatically since its introduction in the early-to-mid 1980's. The expanding use of this technology has been accompanied by concerns about health. In the late 1990s, several expert groups critically reviewed the evidence on health effects of low-level exposure to radiofrequency (RF) electromagnetic fields, and recommended research into the possible adverse health effects of mobile telephone use.

IARC co-ordination of a multinational effort in cancer research

As a result, the [International Agency for Research on Cancer \(IARC\)](#) coordinated a feasibility study in 1998 and 1999, which concluded that an international study of the relationship between mobile phone use and brain tumour risk would be feasible and informative.

Scope of the Interphone study

Interphone was therefore initiated in 2000 as an international set of case-control studies in 13 countries around the world² focusing on four types of tumours in tissues that most absorb RF energy emitted by mobile phones: tumours of the brain (glioma³ and meningioma⁴), of the acoustic nerve (schwannoma⁵), and of the parotid gland⁶. The objective was to determine whether mobile phone use increases the risk of these tumours. Interphone is the largest case-control study of mobile phone use and brain tumours yet and includes the largest numbers of users with at least 10 years of exposure.

Scientific direction of Interphone

The Interphone International Study Group, made up of 21 scientists⁷, was responsible for the progress of the study, the choice of analyses to be conducted, and the interpretation and publication of results. All the decisions about the study were made exclusively and collectively by the Interphone International Study Group. In the course of the study, the IARC Principal Investigator, Dr Elisabeth Cardis, moved to the [Centre for Research in Environmental Epidemiology \(CREAL\)](#) in Barcelona, Spain, where she continues her role as Interphone Principal Investigator, although the 13-country dataset remains at IARC.

Funding of Interphone

The Interphone study was undertaken as a collaborative effort between a number of partner institutions⁸, co-ordinated by IARC. To date, the overall funding assigned to the Interphone study amounts to approx. 19.2 million euros (€). Of this amount 5.5 million € were contributed by industry sources.

¹ "Brain tumour risk in relation to mobile telephone use: results of the INTERPHONE international case-control study", the Interphone Study Group. *International Journal of Epidemiology* 2010;1–20. doi:10.1093/ije/dyq079. Plus Appendix 1; Appendix 2.

² Australia, Canada, Denmark, Finland, France, Germany, Israel, Italy, Japan, New Zealand, Norway, Sweden and the UK.

³ A cancer of the brain that begins in glial cells (cells that surround and support nerve cells). See also [Epidemiology of brain tumours](#).

⁴ A type of slow-growing tumour that forms in the meninges (thin layers of tissue that cover and protect the brain and spinal cord). Most meningiomas are benign and usually occur in adults.

⁵ A tumour of the peripheral nervous system that arises in the nerve sheath (protective covering). It is almost always benign, but rare malignant schwannomas have been reported.

⁶ Tumour that forms in a parotid gland, the largest of the salivary glands, which make saliva and release it into the mouth. There are two parotid glands, one in front of and just below each ear. Most salivary gland tumours begin in parotid glands.

⁷ See Annex A for list of members.

⁸ See list of participating institutions in Annex B.

Interphone study reports on mobile phone use and brain cancer risk

STRICT EMBARGO UNTIL 18 May 2010 - 1:30AM, Paris time

Of these 5.5 million €, 3.5 million € were contributed by the Mobile Manufacturers' Forum (MMF) and the GSM Association, each contributing half of that amount, through a firewall mechanism provided by the [UICC \(International Union against Cancer\)](#) to guarantee the independence of the scientists. Most of the rest of the 5.5 million € came indirectly to individual centers from mobile phone operators and manufacturers, for example, through taxes and fees collected by government agencies. Only 0.5 million € (2.5%) of the overall study costs were provided directly by the industry, in Canada and France, under contracts which preserved the independence of the study.

Other funding was provided by the European Commission (3.74 million €) and national and local funding sources (9.9 million € in total) in participating countries.

Additional funding for the extension of the research to younger and older age groups was received directly from mobile phone operators in the UK under contracts which preserved the independence of the study.

Results

The Interphone Study Group summarized its findings as follows:

"A reduced odds ratio (OR)⁹ related to ever having been a regular mobile phone user was seen for glioma [OR 0.81; 95% confidence interval (CI) 0.70-0.94] and meningioma (OR 0.79; 95% CI 0.68-0.91), possibly reflecting participation bias or other methodological limitations. No elevated OR was observed \geq 10 years after first phone use (glioma: OR 0.98; 95% CI 0.76-1.26; meningioma: OR 0.83; 95% CI 0.61-1.14). ORs were $<$ 1.0 for all deciles of lifetime number of phone calls and nine deciles of cumulative call time. In the tenth [highest] decile of recalled cumulative call time, \geq 1640 h, the OR was 1.40 (95% CI 1.03-1.89) for glioma, and 1.15 (95% CI 0.81-1.62) for meningioma; but there are implausible values of reported use in this group. ORs for glioma tended to be greater in the temporal lobe¹⁰ than in other lobes of the brain, but the CIs around the lobe-specific estimates were wide. ORs for glioma tended to be greater in subjects who reported usual phone use on the same side of the head as their tumour than on the opposite side."

Conclusions

The Interphone Study Group concluded with the following key message:

A reduced OR for glioma and meningioma related to ever having been a regular mobile phone user possibly reflects participation bias or other methodological limitations. No elevated OR for glioma or meningioma was observed \geq 10 years after first phone use. There were suggestions of an increased risk of glioma, and much less so meningioma, in the highest decile of cumulative call time, in subjects who reported usual phone use on the same side of the head as their tumour and, for glioma, for tumours in the temporal lobe. Biases and errors limit the strength of the conclusions that can be drawn from these analyses and prevent a causal interpretation.

Change in pattern of use

The majority of subjects were not heavy mobile phone users by today's standards. The median lifetime cumulative call time was around 100 hours, with a median of 2 to 2½ hours of reported use per month. The cut-point for the heaviest 10% of users (1640 hours lifetime), spread out over 10 years, corresponds to about a half-hour per day.

Today, mobile phone use has become much more prevalent and it is not unusual for young people to use mobile phones for an hour or more a day. This increasing use is tempered, however, by the lower emissions, on average, from newer technology phones, and the increasing use of texting and hands-free operations that keep the phone away from the head.

What next?

Dr Christopher Wild, Director of IARC said: "An increased risk of brain cancer is not established from the data from Interphone. However, observations at the highest level of cumulative call time and the changing patterns of mobile phone use since the period studied by Interphone, particularly in young people, mean that further investigation of mobile phone use and brain cancer risk is merited."

Professor Elisabeth Cardis said that "the Interphone study will continue with additional analyses of mobile phone use and tumours of the acoustic nerve and parotid gland." She added: "Because of concerns about the rapid increase in mobile phone use in young people – who were not covered by Interphone –, CREAL is co-ordinating a new project, [MobiKids](#), funded by the European Union, to investigate the risk of brain tumours from mobile phone use in childhood and adolescence."

IARC has scheduled a comprehensive review of the carcinogenic potential of mobile phone use under the auspices of its [Monographs Programme](#). The review, scheduled for 24-31 May 2011, will consider all published epidemiological and experimental evidence, including the new data from the Interphone study.

⁹ The odds ratio (OR) is a measure of relative risk. In other terms, an OR of x is taken as meaning that people exposed have x times the risk of non-exposed people.

¹⁰ The temporal lobe is the region of the brain located nearest the ear.

Interphone study reports on mobile phone use and brain cancer risk
STRICT EMBARGO UNTIL 18 May 2010 - 1:30AM, Paris time

Communication of results to media and interested parties

This press release was prepared jointly by [IARC](#), [UICC](#) and [CREAL](#). It was decided by the Interphone Study Group, and in conformity with the [Study Protocol](#), that the [IARC Communications Group](#), jointly with [CREAL](#) and [UICC](#), would communicate with international partners, including the European Commission and the World Health Organization, a maximum of 7 days ahead of publication, under embargo conditions.

-ENDS-

Contacts for the media:

[Pr Elisabeth Cardis](#), Interphone Principal Investigator: +34 932 147 312

[Dr Christopher Wild](#), IARC Director: +33 472 738 577

[Dr Vincent Coglianò](#), IARC Monographs: +33 472 738 476

[Dr Nicolas Gaudin](#), IARC Communications: +33 472 738 567; +33 680 572 966

[Dr Gisela Sanmartín Vidal](#), CREAL Communications: +34 932 147 333 / +34 696 912 841

Interphone study reports on mobile phone use and brain cancer risk
STRICT EMBARGO UNTIL 18 May 2010 - 1:30AM, Paris time

ANNEX A: LIST OF MEMBERS AND CONTACT DETAILS

IARC/CREAL

➤ [Professor Elisabeth Cardis](#)
Research Professor in Radiation Epidemiology
CREAL-Centre for Research in Environmental Epidemiology
Parc de Recerca Biomèdica de Barcelona (despatx 183)
Doctor Aiguader, 88
08003 Barcelona
Spain
Tel. +34 93 214 7312
Fax +34 93 214 7302
Email: ecardis@creal.cat
Web: www.creal.cat

Assistant: Eva Herrero
Tel. + 34 93 2147340
Fax +34 93 2147302
Email: eherrero@creal.cat

Australia

➤ [Dr Bruce Armstrong](#)
Professor of Public Health
[Sydney School of Public Health](#)
The University of Sydney

For appointments
Sally Xexenis
E-mail: sallyx@health.usyd.edu.au
Tel. +61 2 9036 5040

To contact Dr Bruce Armstrong directly
Tel. +61 2 9036 6308
Fax. +61 2 9036 7021
E-mail: bruce.armstrong@sydney.edu.au
Office: Room 324
Edward Ford Building A27
The University of Sydney - Camperdown Campus
NSW 2006
[Map](#)

➤ [Dr Graham Giles](#)
Director, Cancer Epidemiology Centre
[The Cancer Council Victoria](#)
1 Rathdowne St, Carlton,
Vic, 3053
Email: graham.giles@cancervic.org.au

Canada

➤ [Professor Daniel Krewski](#)
NSERC Chair in Risk Science
Professor and Director
[McLaughlin Centre for Population Health Risk Assessment](#)
[University of Ottawa](#)
Room 320, One Stewart Street
Ottawa, Ontario K1N 6N5
Tel. +1 (613) 562 5381
Fax. +1 (613) 562 5380
Web: www.mclaughlincentre.ca

Administrative Assistant: Karin Bhookun, BA
Tel. +1 (613) 562 5381
Email: cphra@uottawa.ca

Interphone study reports on mobile phone use and brain cancer risk
STRICT EMBARGO UNTIL 18 May 2010 - 1:30AM, Paris time

➤ **Professeur Marie-Élise Parent**
Institut national de la recherche scientifique
Institut Armand-Frappier
Unité d'épidémiologie et biostatistique
531, boulevard des Prairies
Laval (Québec) H7V 1B7
Tel. +1 (450) 686 5676
Fax. +1 (450) 686 5599
Email: marie-elise.parent@iaf.inrs.ca
Web: www.iaf.inrs.ca

➤ **Professor Jack Siemiatycki**
Professor and Canada Research Chair in **Environmental Epidemiology and Population Health**
Université de Montréal
Research Center of CHUM
3875 rue Saint-Urbain, 3rd floor
Montréal Qc) H2W 1v1
Tel. +1 (514) 890 8166
Fax. +1 (514) 412 7106
Email: j.siemiatycki@umontreal.ca

➤ **Dr Mary McBride**
Cancer Control Research Program
B.C. Cancer Agency
600 W. 10th Avenue
Vancouver, BC V5Z 4E6
Tel. +1 (604) 675 8059
Fax. +1 (604) 877 1868
Email: mmcbride2@bccancer.bc.ca

Denmark

➤ **Dr Christoffer Johansen**
Head, **Department of Psychosocial Cancer Research**
Institute of Cancer Epidemiology
Copenhagen
Tel. +45 35 25 76 27
Email: christof@cancer.dk

Finland

➤ **Dr Anssi Auvinen**
Department of Epidemiology
University of Tampere
Tampere School of Public Health
Medisiinarinkatu 3,
33520 Tampere
Tel. +358 335 516 883
Fax +358 335 516 057
Email: auvinen@uta.fi

France

➤ **Dr Martine Hours**
Médecin Epidémiologiste
Unité Mixte de Recherche épidémiologique et de surveillance
Transport Travail Environnement
8, avenue Rockefeller
69373 Lyon Cedex 08
Tel. +33 472 142 522
Fax. +33 478 742 582
Email: martine.hours@inrets.fr

Interphone study reports on mobile phone use and brain cancer risk
STRICT EMBARGO UNTIL 18 May 2010 - 1:30AM, Paris time

Germany

- Dr Joachim Schüz
Head, Department of Biostatistics and Epidemiology
[Institute of Cancer Epidemiology](#)
[Danish Cancer Society](#)
Strandboulevarden 49
DK-2100 Copenhagen
Tel. +45 35 25 76 55
Fax. +45 35 25 77 31
Email: joachim@cancer.dk

 - Professor Maria Blettner
[Institut für Medizinische Biometrie, Epidemiologie und Informatik \(IMBEI\)](#)
Universitätsmedizin der Johannes Gutenberg - Universität Mainz
Obere Zahlbacher Strasse 69
55131 Mainz
- Tel. +49 61 31 17 32 52
Fax. +49 61 31 17 29 68
E-mail: blettner@imbei.uni-mainz.de

Israel

- Professor Siegal Sadetzki
Head, [Cancer and Radiation Epidemiology Unit](#)
The Gertner Institute for Epidemiology and Health Policy Research
The Chaim Sheba Medical Centre
52 621 Tel-Aviv
The Sackler School of Medicine, Tel Aviv University
69 978 Tel-Aviv
Tel. +972 (3) 530 3262
Fax. +972 (3) 534 8360
Email: siegals@gertner.health.gov.il

Italy

- Dr Susanna Lagorio
Senior Researcher
[National Centre for Epidemiology Surveillance and Health Promotion \(CNESPS\)](#)
Istituto Superiore di Sanità
Viale Regina Elena, 299
00161 Rome
Tel. +39 649 904 304
Fax. +39 649 904 305
Email: susanna.lagorio@iss.it

Japan

- Professor Naohito Yamaguchi
Chairperson
Department of Hygiene and Public Health
[Tokyo Women's Medical University](#)
8-1 Kawadacho, Shinjuku-ku
Tokyo 162-8666
Tel. +81 333 538 111 ext 22121
Fax. +81 352 697 420
Email: nyamaguc@vega.ocn.ne.jp

- Professor Toru Takebayashi
[Department of Preventive Medicine and Public Health](#)
[Keio University School of Medicine](#)
35 Shinanomachi, Shinjuku-ku
Tokyo 160-8582
Tel. +81 353 633 756
Fax. +81 333 580 439
Email: ttake@sc.itc.keio.ac.jp

Interphone study reports on mobile phone use and brain cancer risk
STRICT EMBARGO UNTIL 18 May 2010 - 1:30AM, Paris time

New Zealand

➤ Professor Alistair Woodward
School of Population Health
University of Auckland
Private Bag 92019
Auckland 1142
Tel. +64 93 73 75 99 (ext 86361)
Email: a.woodward@auckland.ac.nz

Norway

➤ Dr Tore Tynes
Department of Occupational Health Surveillance, NOA
National Institute of Occupational Health
PO Box 8149 Dep
0033 Oslo
Tel. +47 23 19 51 61
Fax. +47 23 19 52 00
Email: tore.tynes@stami.no

Sweden

➤ Dr Maria Feychting
Professor of Epidemiology
Institute of Environmental Medicine
Karolinska Institute
Box 210
S-171 77 Stockholm
Tel. +46 852 487 465
Fax. +46 8313961
Email: maria.feychting@ki.se

United Kingdom

➤ Professor Anthony Swerdlow
Sir Richard Doll Building
Institute of Cancer Research,
Cotswold Road, Sutton,
Surrey SM2 5NG
Tel. +44 208 722 4012
E-mail: anthony.swerdlow@icr.ac.uk

➤ Professor Patricia McKinney
Division of Epidemiology
Leeds Institute of Genetics, Health and Therapeutics
Room 8.49j, Level 8, Worsley Building
University of Leeds
Leeds
LS2 9JT
Email: p.a.mckinney@leeds.ac.uk

Interphone study reports on mobile phone use and brain cancer risk
STRICT EMBARGO UNTIL 18 May 2010 - 1:30AM, Paris time

ANNEX B: LIST OF PARTICIPATING INSTITUTIONS

Australia

Cancer Council New South Wales
Cancer Council Victoria
The University of Sydney

Canada

-University of Ottawa, Faculty of Medicine, Epidemiology and Community Medicine
-INRS-Institut Armand Frappier, Université du Québec, Laval, Québec
-CRCHUM, Université de Montréal, Montréal, Québec
-Cancer Control Research, British Columbia Cancer Agency, Vancouver

Denmark

- Division for Cancer Epidemiology, Danish Cancer Society, Copenhagen

Finland

-Finnish Centre for Radiation and Nuclear Safety, Helsinki

France

-Institut de Médecine du Travail, Lyon

Germany

-Institute of Medical Biostatistics, Epidemiology and Informatics, University of Mainz, Mainz (coordination)
-Department of Epidemiology and International Public Health, University of Bielefeld, Bielefeld
-Unit of Environmental Epidemiology, German Cancer Research Center, Heidelberg

Israel

-Chaim Sheba Medical Center, Tel-Hashomer

Italy

-Istituto Superiore di Sanità, Rome

Japan

-Tokyo Women's Medical University, Tokyo, Japan

New Zealand

-Wellington School of Medicine, University of Otago, Wellington South
-School of Population Health, University of Auckland
-Centre for Public Health Research, Massey University

Norway

-Norwegian Radiation Protection Authority, Osteras

Sweden

-Karolinska Institute, Institute of Environmental Medicine, Division of Epidemiology,
Stockholm

United Kingdom

-Faculty of Medicine and Health, University of Leeds, Leeds
-National Radiological Protection Board, Didcot
-Scottish Cancer Intelligence Unit, NHS, Scotland
-Section of Epidemiology, Institute of Cancer Research, Sutton

International Organizations

-International Agency for Research on Cancer (IARC), Lyon, France