



International Cohort Study on Mobile Phones and Health

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Presentation

- Background
- Aim of Cosmos
- Study design
- Early results
- Current state of affairs
- Outlook



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Background: why Cosmos?

- Public and scientific interest in the possibility of health risks from RF from mobile phones
 - Amplified by rapid penetration of mobile phones
 - Uncertainties on long-term risks
 - Current exposure guidelines: minimize effects of tissue heating
 - Absence of any credible biological hypotheses and convincing experimental results on how low-level RF could cause disease
- Epidemiological research important for risk identification and assessment
- Cosmos: large prospective cohort study, long-term follow-up



Aim of Cosmos

- To establish an international **cohort** of ~250.000 mobile phone users initially
- To study **prospectively** the possible association between mobile phone use and multiple chronic health outcomes and changes in symptoms and well-being



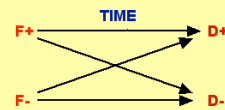
Study Design-1

- Prospective cohort study, features:

- mobile phone use is assessed prior to diagnosis of disease
- objective prospective data on mobile phone use included (mobile phone operators)
- multiple health outcomes
- long-term follow-up (25+ years)
- flexibility to study future changes in technology or research questions

Epidemiologic Methods

PROSPECTIVE OR COHORT



- International pooling of data necessary to study relatively rare disease outcomes (e.g. brain tumors)



Study Design-2

Baseline (recruitment)

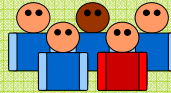
Follow-up

2007 --- 2012 --- 201?

2030...

International cohort:

250.000+



COSMOS
Questionnaire

Every ~4 Years

Public Registers
(Country Dependent)

On demand

Mobile Phone Usage
Operator Data

Yearly

Data

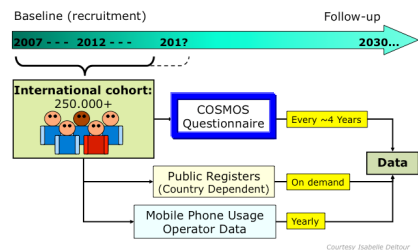
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Mobile phone use

- Self-reported use

- Baseline questionnaire: historical usage, past 3 months
- Follow-up questionnaire (every ~4 years): current use, new technologies
- Hands free use, preferred side of the head during mobile phone use
- Other relevant RF exposures, e.g. cordless phone, wireless computer networks



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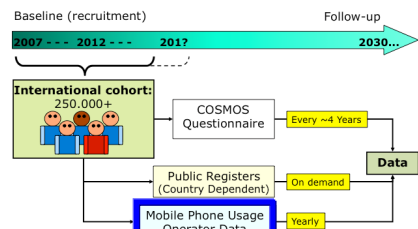


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Mobile phone use

- Supplemental Operator data, including:

- Current use at baseline and during follow-up
 - preferably covers the same 3 month period as in questionnaire
- Number and duration of incoming and outgoing voice calls
- Technical features (IMEI, frequency band used: 800 or 1800 MHz or UMTS), and in some countries:
- Total data transfer (kilobytes)
- Location of first base station concerned



Courtesy Isabelle Debour



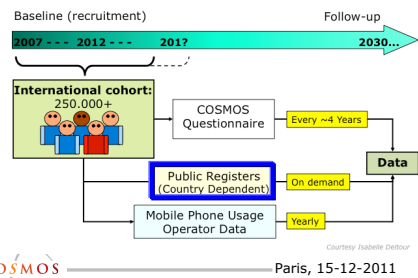
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Health outcomes of interest

- *A priori* defined based on:
 - No seemingly plausible biophysical or biological mechanism known
 - RF from mobile phones is mostly absorbed by the head, yet include the possibility that other tissues could be affected
- Registries, e.g.:
 - Cancer incidence: brain tumours, leukemia, skin cancer
 - Neurological diseases: Alzheimer, other dementia, MS, ALS, Parkinson
 - Cerebrovascular disease

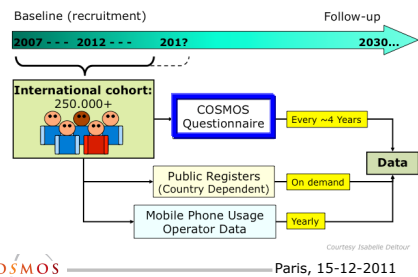


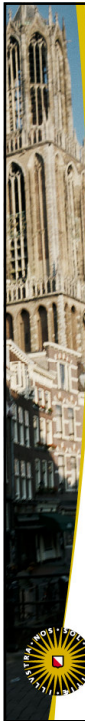
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• Self-reported, e.g. changes in:

- Headache (HIT-6)
- Migraine (ID-migraine)
- Sleep problems (MOS-Sleep)
- Well-being (SF12)





Recruitment strategies

- Random sampling from subscriber lists of operators, stratified by call time and, in some countries, age, sex, and region (DK, SWE, UK, FIN)
- Embed Cosmos in running prospective cohort studies (NL)



Response: pilot studies & 1st launches

- Response % (questionnaire + informed consent):
 - Pilot studies: UK 5%; Finland 9%-13%; Sweden 15-24%
 - Main launch: Denmark 9.6-18%; Sweden 20%; 10-12% Finland
- Fairly low participation rates: what does this mean?
 - Increase in costs for recruitment
 - Less of a concern for the internal validity in prospective cohort studies
 - Might affect statistical power if participation is correlated with exposure, but early results indicate that this is not the case.





Early results: use of wireless devices (baseline questionnaire, restricted to 1st launches)

	Denmark (N= 18,196)	Sweden (N= 33,507)	UK (N=231)
Weekly use of mobile phone	89%	89%	96%
Use of hands-free sets ^a	6%	6%	29%
Cordless phone	69%	85%	83%
-At home	63%	82%	79%
-At work	23%	33%	13%
Wireless LAN	47%	46%	59%
Internet calls ^b	14%	8%	30%

^a: Use 50% or more of the time.

^b: In Denmark use within past 3 months, in Sweden and UK timeframe not specified.

Source: Schüz e.a. Cancer Epidemiology 2011;35;37-43



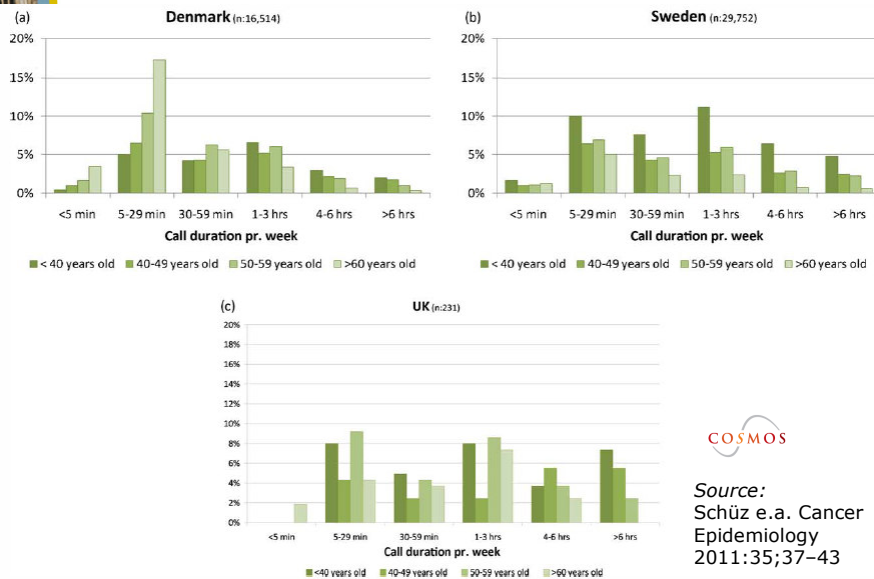
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Early results: weekly mobile phone voice use (baseline questionnaire, 1st launches)








Source:
Schüz e.a. Cancer
Epidemiology
2011;35;37-43

Fig. 1. Weekly mobile phone usage among the international cohort of mobile phone users (Cosmos), by age and amount of self-reported voice usage, enrolled to date by Denmark (a) Sweden (b) and UK (c).



Current state of affairs

- Recruitment: almost finished in participating countries:

	• Denmark (2007+2009)	~ 30k respondents
	• Sweden (2008+2009)	~ 50k respondents
	• UK (2009+2010)	~ 70k respondents
	• Finland (2009+2010+11)	~ 15k respondents
	• The Netherlands (2011+12)	~ 70(-90k) respondents
	Total	~ 230-250k

-  In France: Feasibility study ongoing



Outlook

- Development of follow-up questionnaire: to be launched from 2012 onwards (i.e. ~4 yrs after baseline)
- Baseline data: cleaning ongoing, building towards an analytical dataset for international analyses
- Development of 'hybrid exposure model' to characterize individual mobile phone use
- Possible extension to other countries? (e.g. France?)





Acknowledgments

Sweden

Karolinska Institutet
Anders Ahlbom, Lena Hillert
Maria Feychting, Karin Fremling

Denmark

Danish Cancer Society
Aslak Poulsen

Finland

Radiation and Nuclear Safety Authority
Anssi Auvinen
Sirpa Heinavaara, Katja Kojo

UK

Imperial College London
Paul Elliott
Mireille Toledano

The Netherlands

Utrecht University
Roel Vermeulen
Hans Kromhout

France

IARC
Isabelle Deltour, Joachim Schüz
Martine Hours, Beatrice Fervers

www.thecosmosproject.org



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