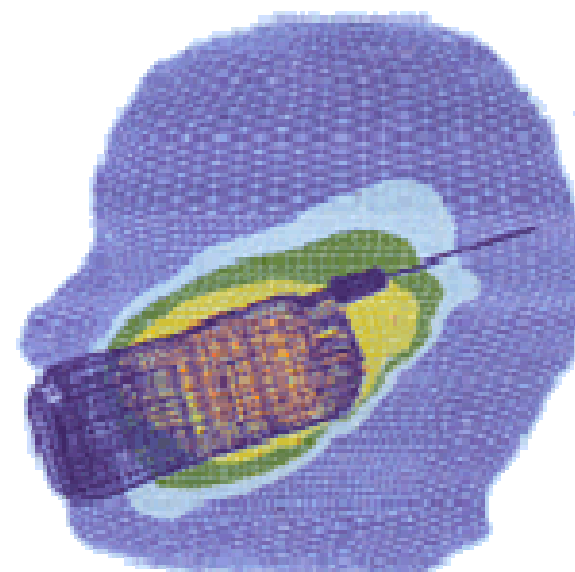




Ongoing Mobile Phone Research Studies and Latest Findings Where Available

Aslak Harbo Poulsen
&
Joachim Schüz



Department of Biostatistics and Epidemiology
Institute of Cancer Epidemiology
Danish Cancer Society
Copenhagen

Current assessment



SCENIHR, ICNIRP 2009:

Mobile phone use:

<10 years: No indications of increased risk of brain tumour or acoustic neuroma.

10+ Years: Data sparse, weak conclusions but:
There seems to be no generally increased risk for brain tumours.

Non-cancer: Few and inconsistent epidemiologic data.

Research Recommendations



SCENIHR 2009, ICNIRP 2009, WHO 2006:

- Prospective studies
Avoid recall bias
- Long term follow up studies
Longer induction times
- Long-term heavy users of mobile phones
Few users before mid 90's
increasing use over time
- Other diseases than tumors of head and neck
e.g. neurodegenerative and symptoms
- Susceptible user groups
- Studies on children

Ongoing studies:

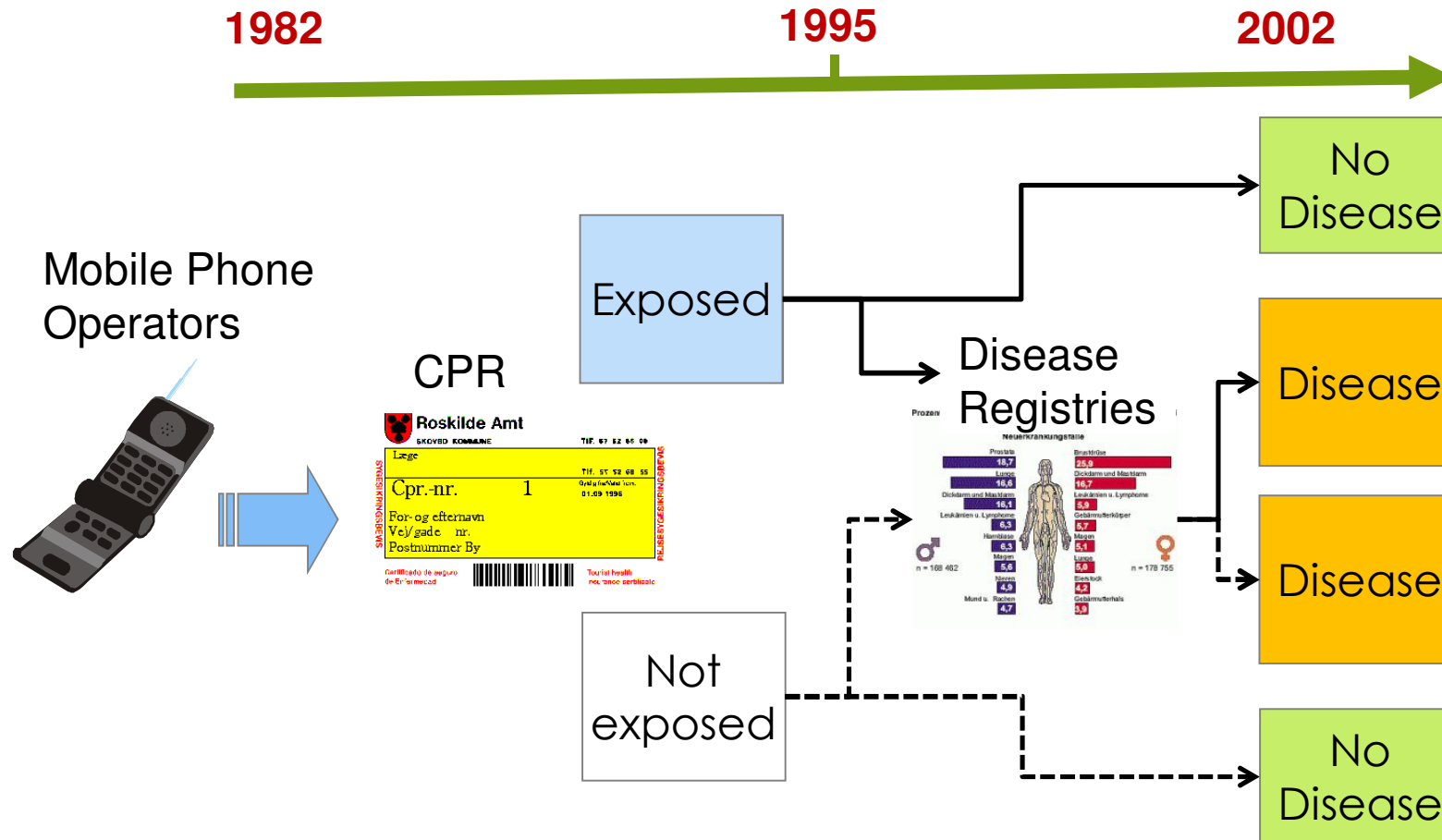
Subscriber Cohort



8+ Studies
Details in next
presentation

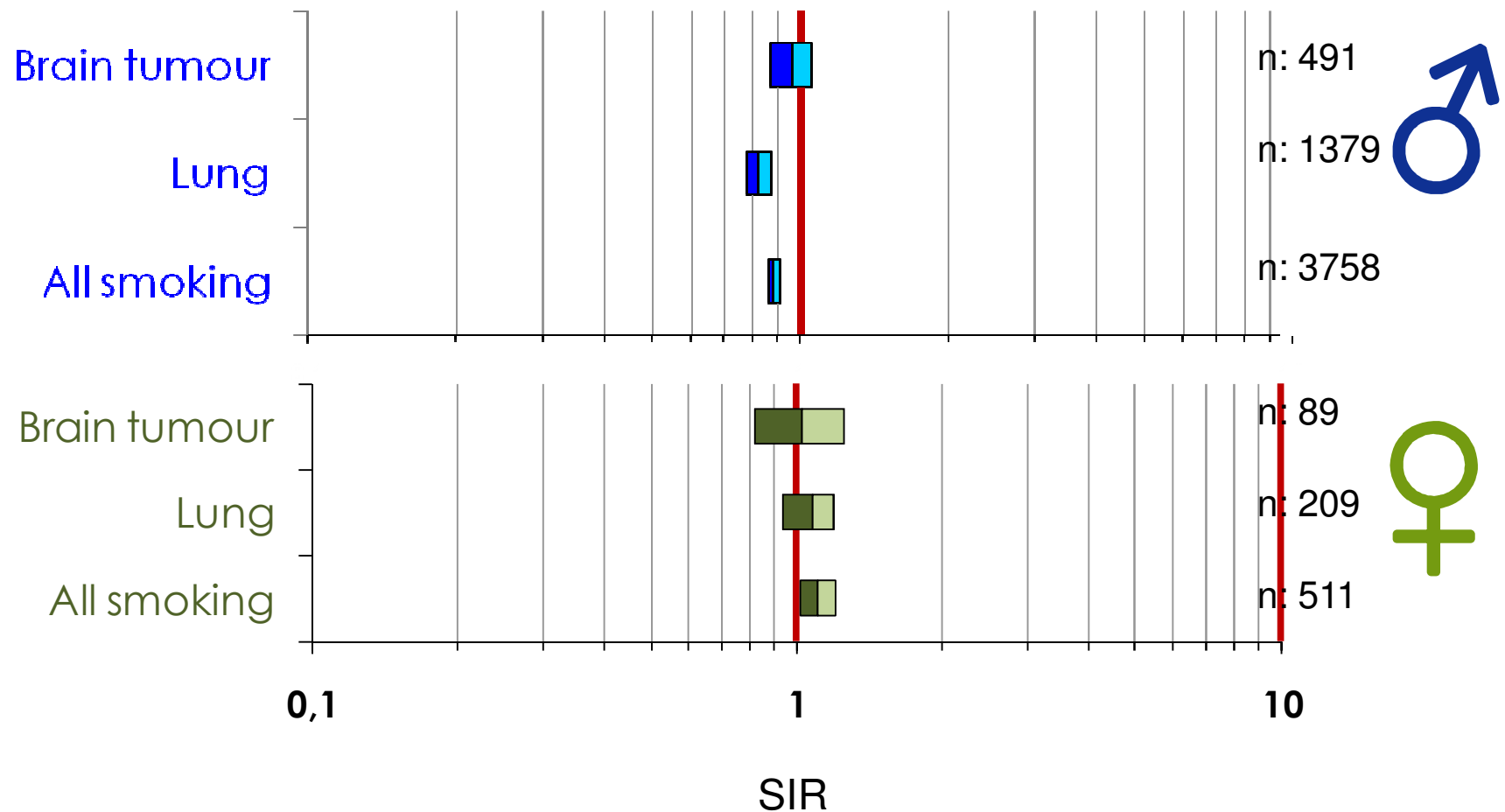


Danish Subscriber Cohort



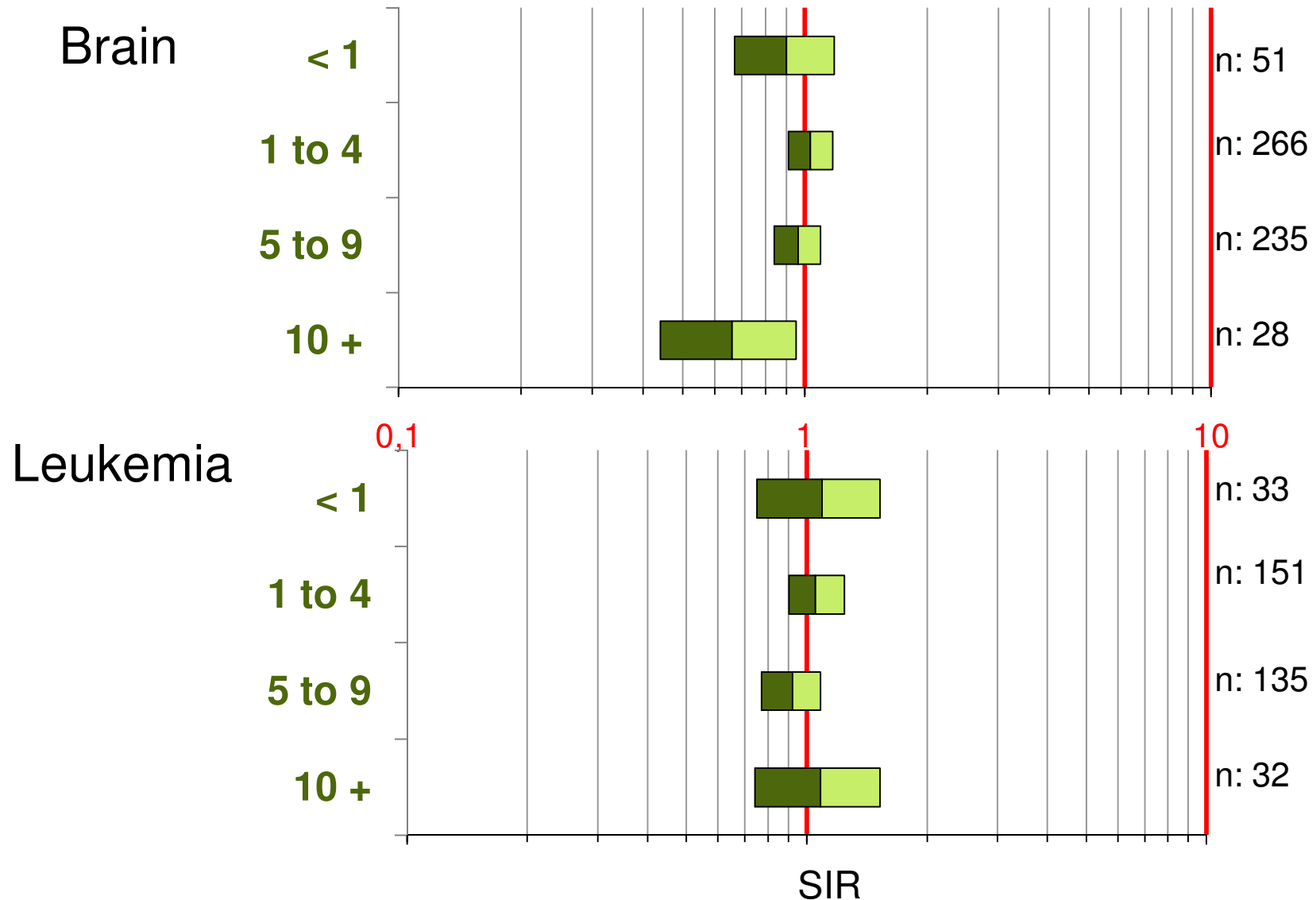
~720,000 records → 420,095 individuals → (14,249 cancers)
 (85% male 11% 1st subscription before 1992)

SUBSCRIBER COHORT 1



(Schüz et al, 2006)

SUBSCRIBER COHORT 2



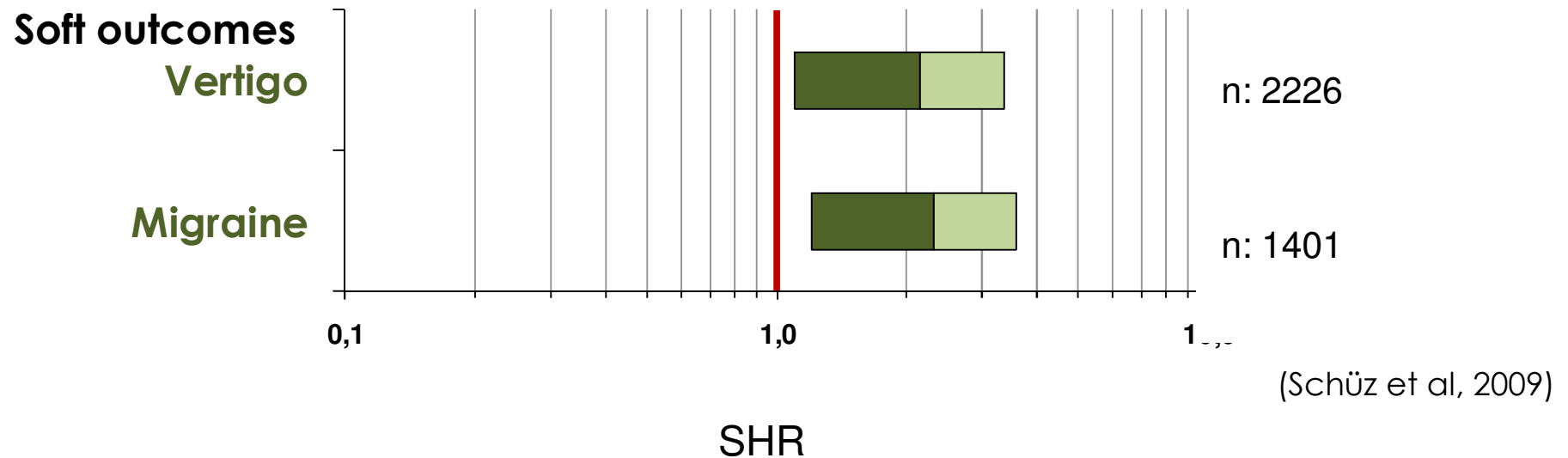
SUBSCRIBER COHORT 3



Disease	Latency (years)*	Observed	Expected	SHR	CI
Alzheimer disease	Total	81	114.9	0.7	0.6–0.9
	≥10	5	13.1	0.4	0.1–0.9
Vascular dementia	Total	68	95.7	0.7	0.5–0.9
	≥10	13	11.8	1.1	0.6–1.9
Other dementia	Total	383	551.1	0.7	0.6–0.8
	≥10	33	54.8	0.6	0.4–0.9
Parkinson disease	Total	237	295.1	0.8	0.7–0.9
	≥10	35	31.6	1.1	0.8–1.5
Amyotrophic lateral sclerosis	Total	104	99.9	1.0	0.9–1.3
	≥10	7	10.1	0.7	0.3–1.4
Multiple sclerosis	Total	528	509.3	1.0	0.9–1.1
	≥10	25	29.4	0.9	0.6–1.3
Epilepsy (men)	Total	1767	2420.6	0.7	0.7–0.7
	≥10	98	176.0	0.6	0.5–0.7
Epilepsy (women)	Total	337	318.4	1.1	0.9–1.2
	≥10	5	7.1	0.7	0.2–1.6

(Schüz et al, 2009)

SUBSCRIBER COHORT 4



Causal?

- Reverse causation (cases more likely to become users)
- Diagnostic bias (users more likely to go to hospital?)



Strengths and Limitations

Conclusion: No major increased risk for brain tumours



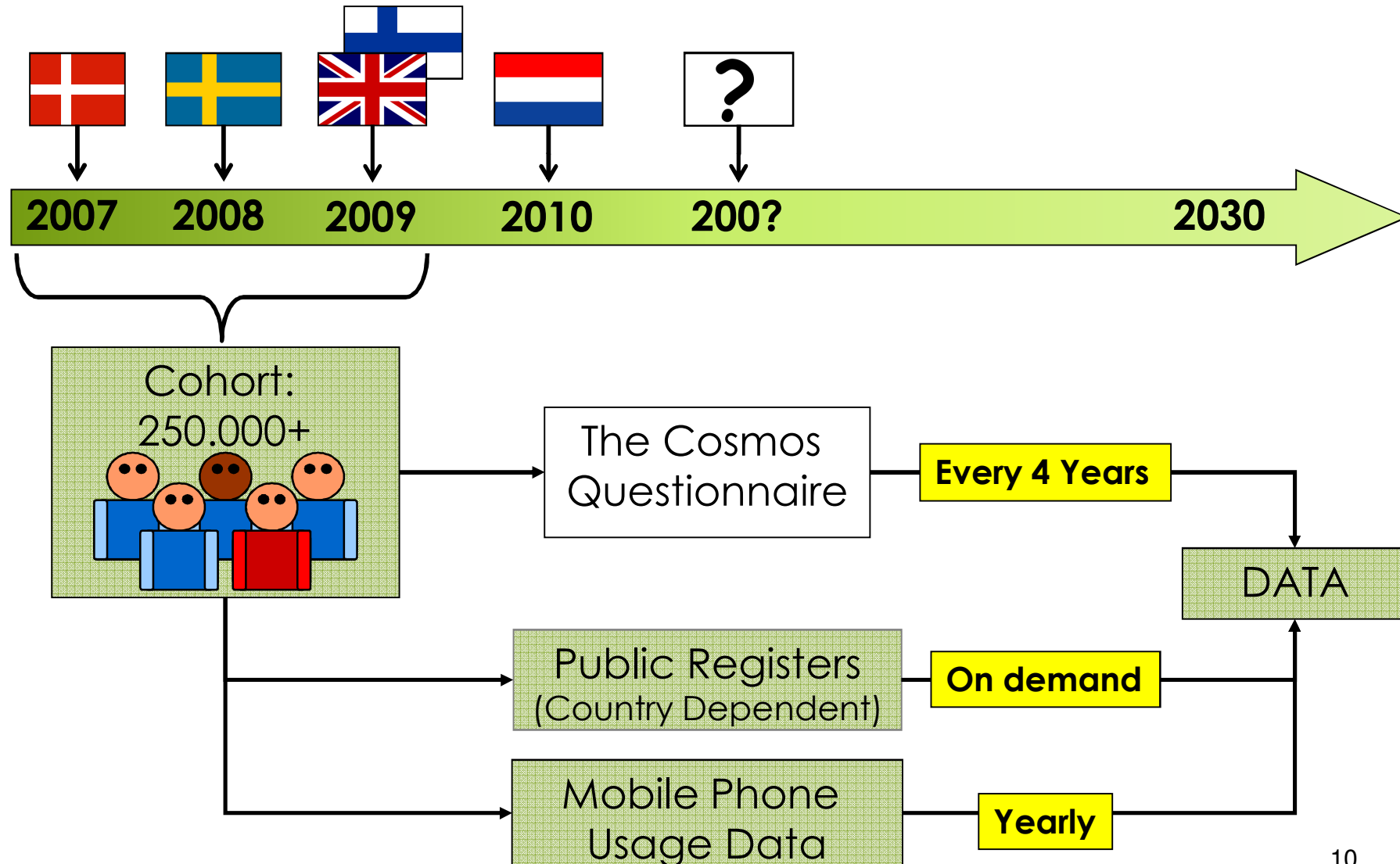
- Generalizability – whole country included
- Objective exposure metric
- Linkage of independently collected data
- Includes all long-term subscribers in Denmark
- Long follow-up



- Subscription \neq Usage
Company, Nonusers, Nonsubscribers, start > 1995
(cohort includes 4 times more mobile phone users)
- No usage details
dose, headsets etc.
- No other data
other EMF sources, details about usage, income, other possible confounders

COSMOS:

International Cohort Study of Mobile Phone Use and Health





Questionnaire Content 1

Information	Source:	
	Self	Operator
2 Most used phones	Link	
# calls / week	x	x
# min / week	x	x
Data trafic	x	x
Laterality	x	
Lending and borrowing	x	
Handsfree freq. and tech.	x	
# attempted calls		x
SMS (text messages)		x
Call technology		x
Phone model(s)		Link

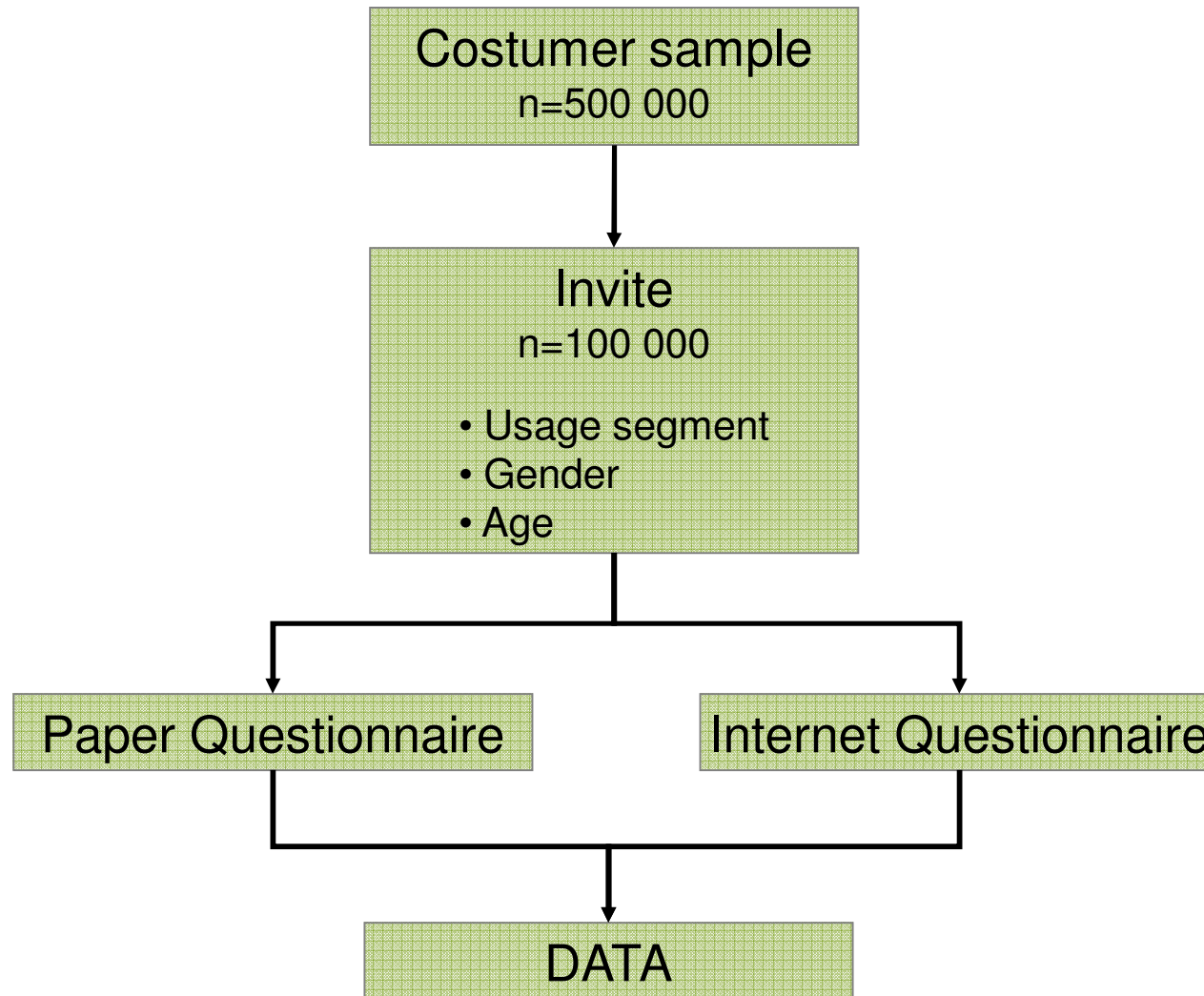
Questionnaire Content 2



- Self assessed health (*SF12*)
- Headache (*HIT-6*)
- Migraine (*ID Migraine*)
- Sleep (*MOS Sleep Scale*)
- Memory
- Tinnitus
- Asthma & Allergies
- Medication
- Smoking
- Alcohol
- Diet
- Physical activity
- Education & Occupation



Recruitment Procedure



Participation and responserate 2



Invited: 100.000

Responserate: 18%

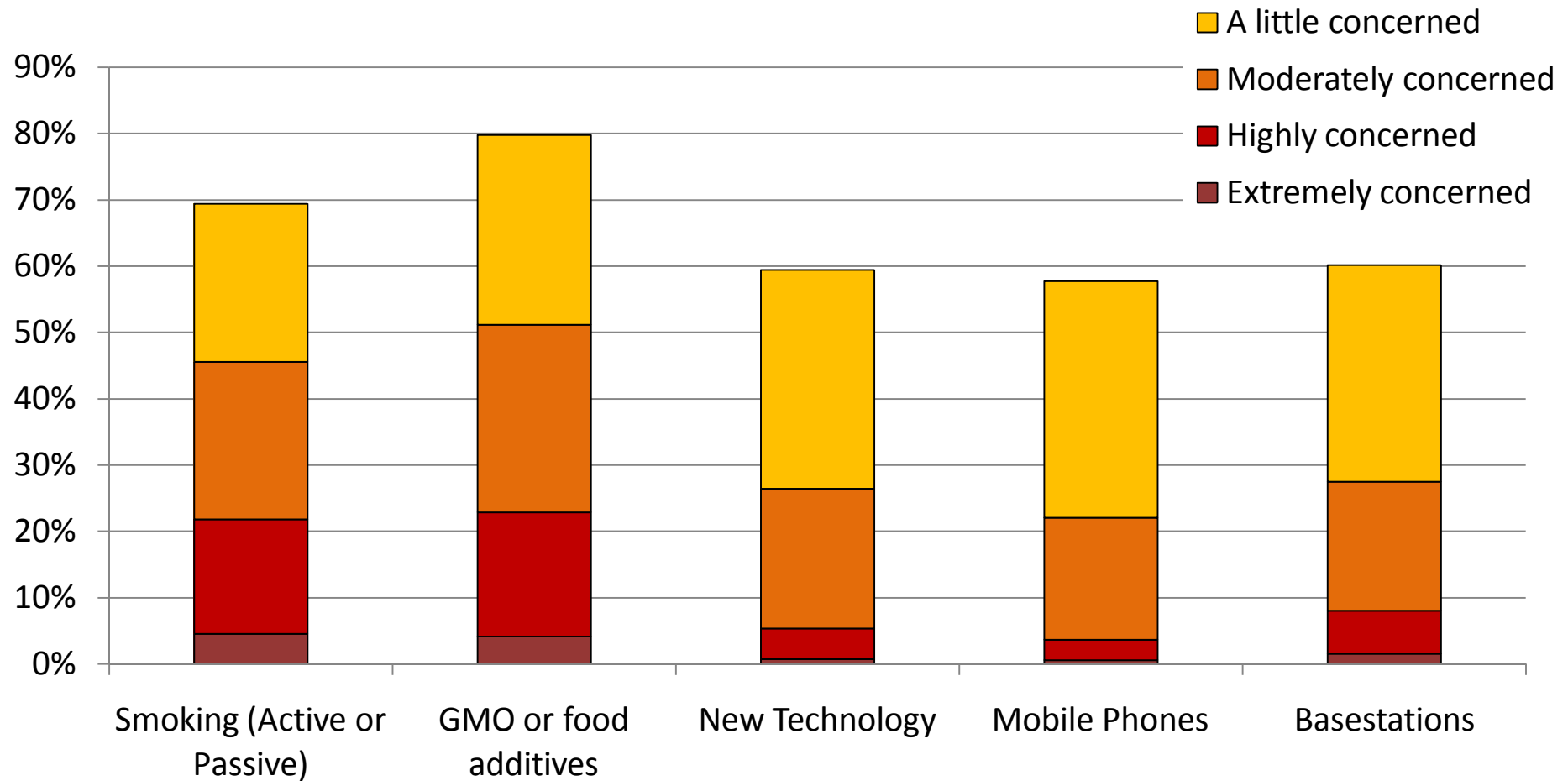
age	Response rate			Cohort Composition		
	Male	Female	Total	Male	Female	Total
25-39	11%	20%	14%	45%	55%	20%
40-49	12%	18%	15%	50%	50%	20%
50-59	17%	23%	20%	53%	47%	27%
60-67	23%	26%	24%	57%	43%	33%
Total	16%	22%	18%	52%	48%	100%

Usage category	Response rate	Cohort composition
1	21%	29%
2	19%	27%
3	16%	43%
Total	18%	100%

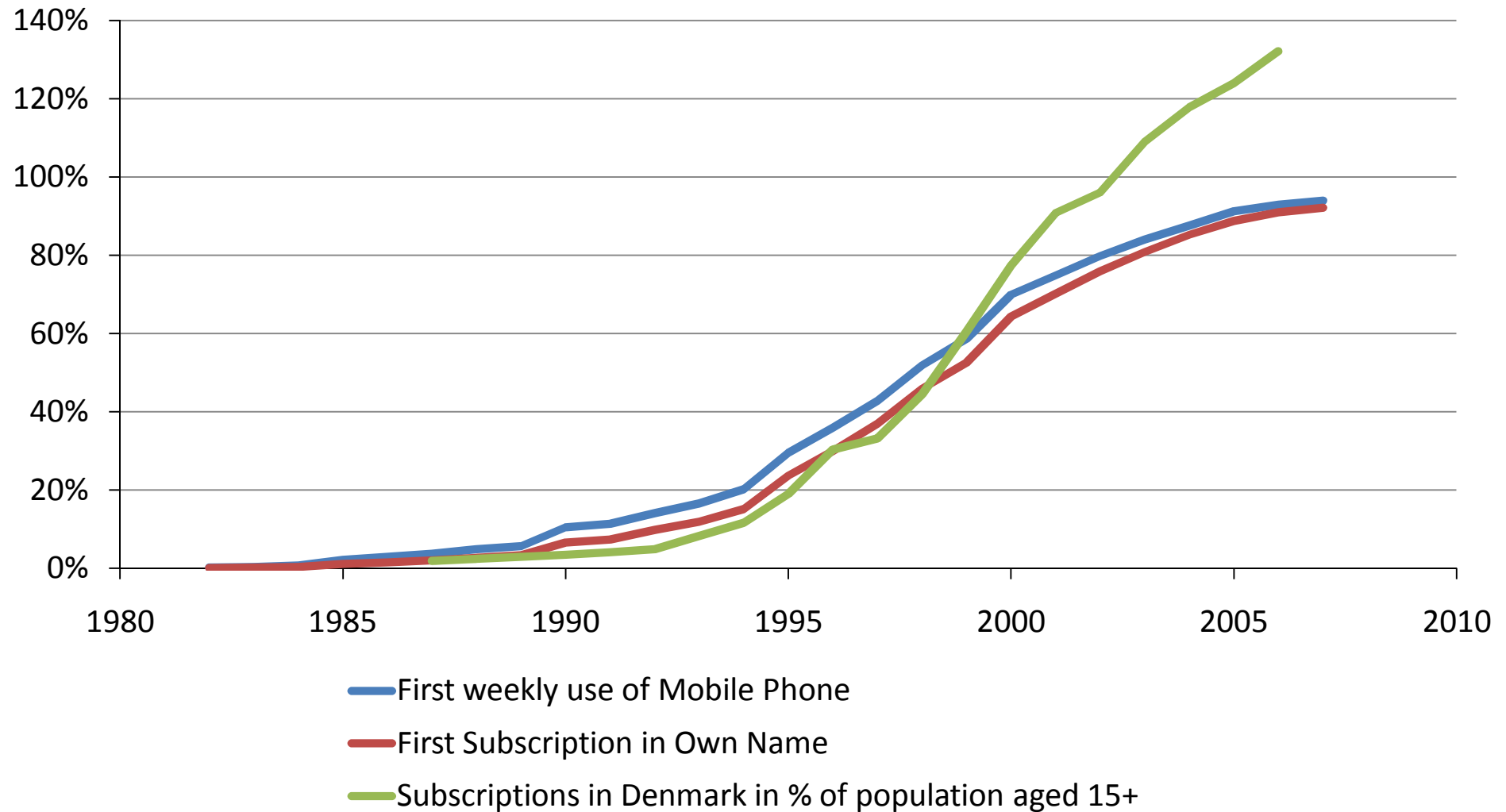
COSMOS: Danish Cohort Composition



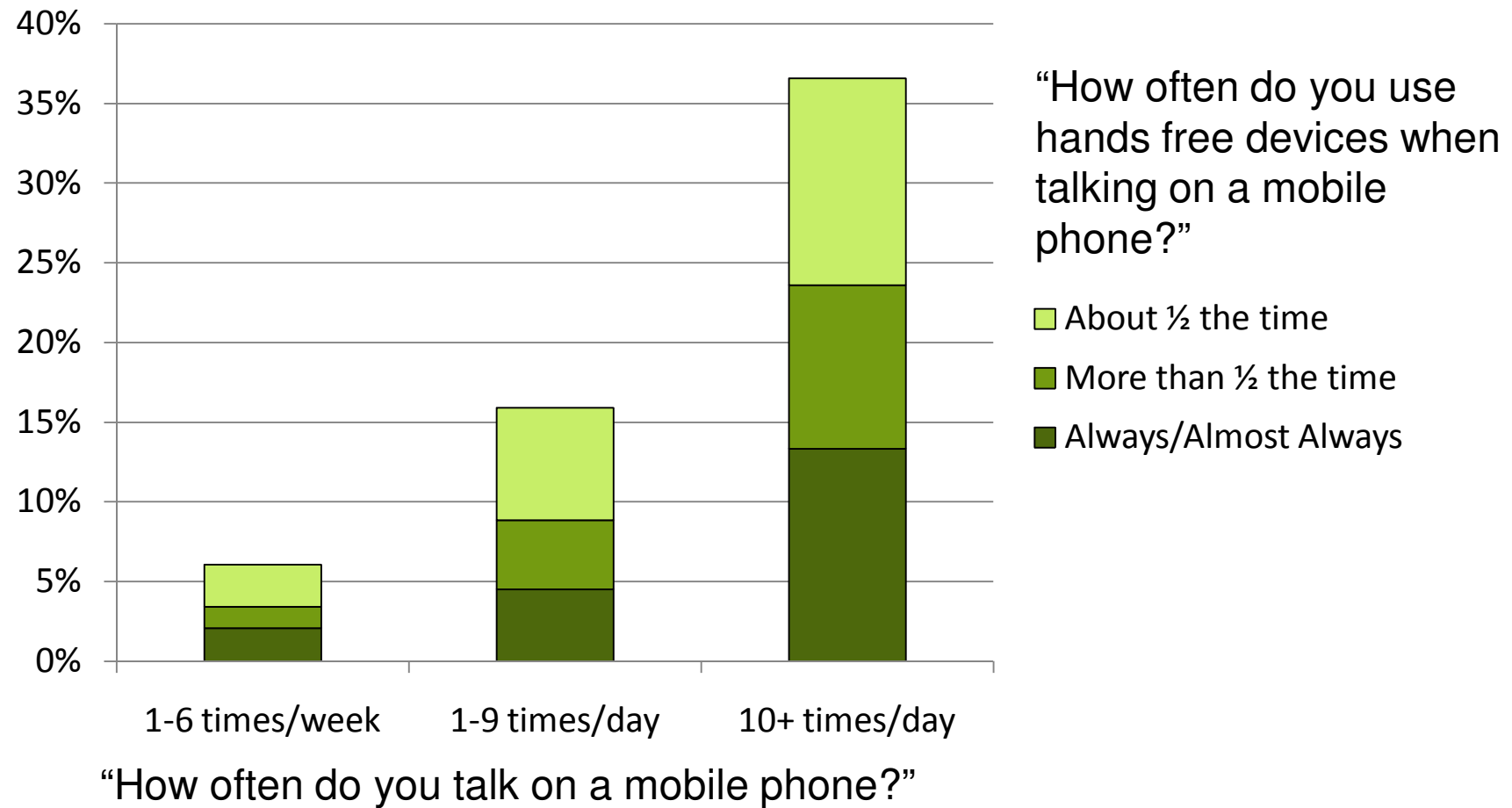
“Please rate your concern about the effect of the following issues on your personal health:”



COSMOS: Danish Cohort Composition



COSMOS: Danish Cohort Composition



Preliminary Danish data



Usage:

- Talk > 4 h/week 13 %

Other RF-Sources used:

- Bluetooth more than 50% of the time: 6%
- DECT cordless phone 70 %
- Wireless LAN (personal use ≥ 1 h/week) 48 %
- IP telephony (weekly+) 10 %
- Computer work > 4h/workday 33%

Power



Minimum relative risk detectable after 10 years

Exposure distribution	Age structure	Relative Risk		
		(1)#	(2)#	(3)#
30% low, 30% middle, 40% high *	Equal for all exposure categories	1.07	1.34	2.81
	more young people in high exposure*	1.09	1.40	3.36

(n=250,000, 80% power, 5% significance level)

1) incidence: 400/100,000; (stroke)

2) incidence: 15/100,000; (brain tumour)

3) incidence: 1/100,000; (salivary gland tumours, mortality)

Advantages of Ongoing studies



- Improved exposure assessment
 - Multiple sources
 - Prospective
 - Continuous and flexible data collection
- Multiple end-points
 - including non-cancer and soft outcomes
- Rapid investigation of new hypothesis
 - Surveillance system

Acknowledgements:



Aslak Harbo Poulsen
Joachim Schüz
Institute of Cancer Epidemiology



Anders Ahlbom
Karolinska Institute



Paul Elliott
Imperial College London



Anssi Auvinen
STUK + University of Tampere



Hans Kromhout
Utrecht University

Danish Subscriber Cohort



Aslak Harbo Poulsen
Joachim Schüz
Rune Jacobsen
Jørgen H Olsen
Christoffer Johansen
Institute of Cancer Epidemiology

Gunhild Waldemar
Copenhagen University Hospital



John D Boice Jr.
Joseph K McLaughlin
International Epidemiology Institute