

Risk perception and risk communication

Ivar Sønbo Kristiansen, Dorte Gyrd-Hansen,
Jesper Bo Nielsen, Jørgen Nexø
University of Southern Denmark
Odense Risk Group (www.almen.dk/Odense)

My menu

- The concept of risk
- Are Danes concerned? (risk perception)
- Do people trust the information they have received?
- Choice of information format (risk communication)



The concept of risk

The epidemiologic definition:

- "The probability of an adverse event"

The lay-person definition:

- "A situation or an event where something of human value (including human themselves) is at stake and where the outcome is uncertain"

Risk perception and communication



Goal: maximum consistence

Methods:

- More knowledge about "true" risk
- More information about perceived risk
- Better risk communication

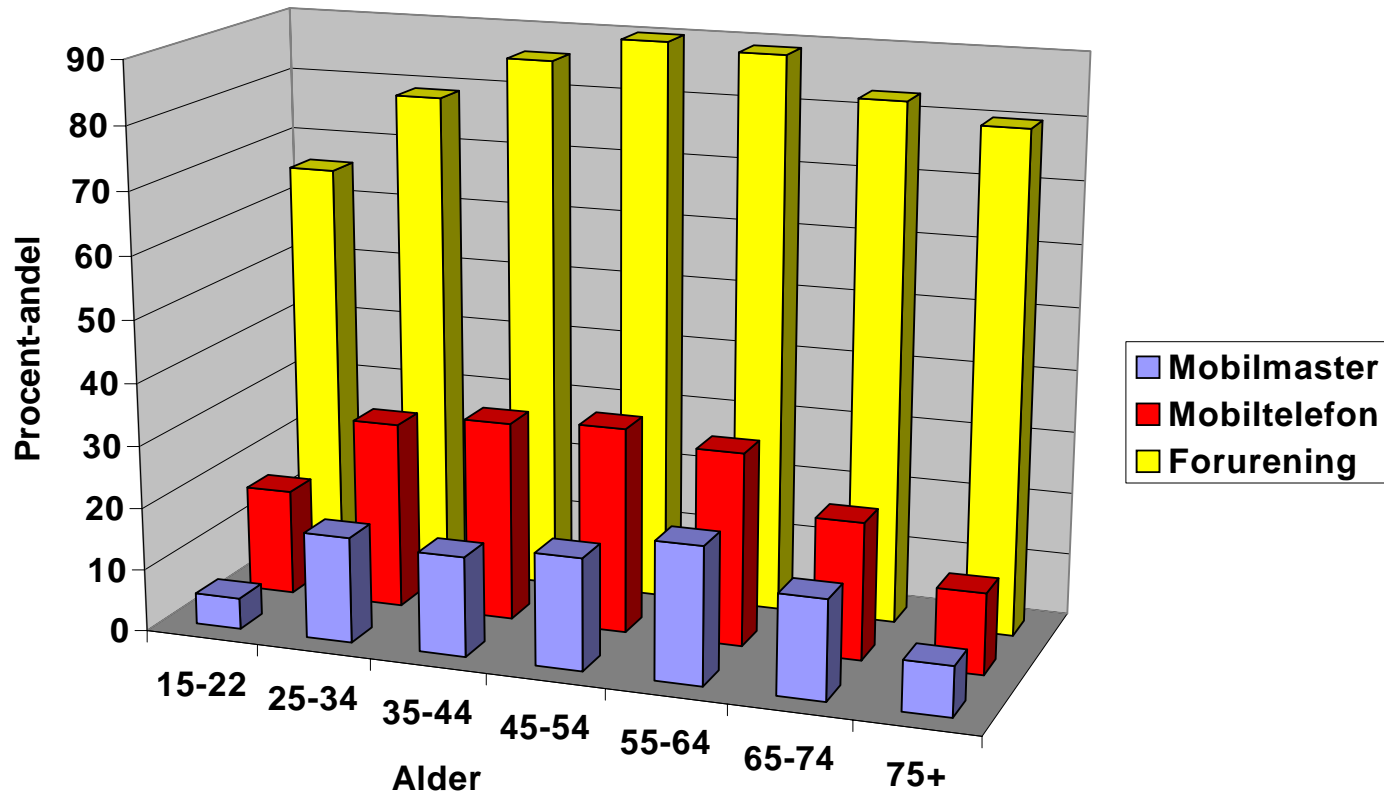
Research questions

- What proportions are concerned – and to what extent?
- What else are they concerned about?
- What sources of information do people trust?
- What proportions are concerned about driving a car while talking on mobile phone? How best to communicate risk?

Methods

- Qualitative - 19 interviews 2005 (report in Danish + paper in English)
- Preliminary survey 2004 (report in Danish and paper in English)
- Final survey 2006 (3 papers in English)

”Thinking about sometimes or often” (n=1004)



Predictors: Sex, utilisation, education

Perceived health risk of mobile phones and masts

- Die from lightning (1/year) 49%
- Die from nautic accident (5/year) 24%
- Die in fire (10/year) 11%
- Die from homocide (50/year) 5%
- Die in traffic accident (500/yr): 5%
- Die from lung cancer (2500/year) 7%

Sources of information about health risks

Newspapers, radio/TV	94%
Books or brochures	42%
Health information campaigns	52%
Magazines	26%
Internet	34%
Friends and acquaintances	60%
Other	1%

”How trustworthy do you consider information about health risk to be from?”

- Cancer Society 4,3
- Directorate of health 4,3
- Minister of science 4,1
- Universities 3,7
- Minister of health 3,7
- Local governments 3,2
- Telecom companies 2,4

Likert scale: 1=not trustworthy; 6=very trustworthy

Final survey

- Internet-based questionnaire
- N=1687 (66%); aged 20-69
- 60-69 under-represented, well-educated overrepresented
- Questions about attitude and behaviour in relation to mobile phone
- Respondents were randomised to three types of information on risks related to use of mobile phones

Mobile phone and driving

- **Do you talk on mobile phone while driving a car?**
 - Yes: 46%
 - No: 54%
- **If yes, are you aware of the risk, also when using headset?**
 - Yes, but I am driving safely: 29%
 - Yes, but I do not believe in it: 7%
 - Yes, but it is necessary: 19%
 - Yes, but only recently: 3%
 - No, I thought it was OK with handsfree set: 16%
 - Haven't thought about it: 7%
 - Other/do not know: 19%

Hypotheses about information

In contrast to brief technical information and simple advice, extensive information about the mobile phone radiation is:

- More useful
- More informative
- More understandable
- More trustworthy
- Creating less concern

Short information (group 1)

- Experts state that health consequences following exposure to radiation within the applied and approved frequencies used for mobile phones have not been demonstrated in humans
- A few studies have, however, indicated that radiation within the applied and approved frequencies used for mobile phones may affect experimental animals and cells, and that children are expected to be more susceptible than adults to radiation. Whether these observations have implications for human risk related to mobile phones is presently not known

Short information (group 1)

- Radiation from mobile phones as well as base stations in Denmark are all within the officially approved limits
- Use of head-set reduces exposure to radiation from mobile phones significantly.

Extended information (group 2)

- **Distance:** Mobile phones and other wireless communication equipment continuously send out radiation when not turned off – but significantly less than when actively used, i.e. when talking in mobile phone. Wireless phones send out less radiation than mobile phones due to a shorter distance to the base station. The shorter the distance between phone and base station, the lower the radiation from the phone. And the further away you are from the radiation source (phone or base station), the less exposure to radiation (radiation decreases significantly with distance to source). Use of head set increases the distance between ear and source of radiation and reduces the exposure of the head to radiation.

Extended information (group 2)

- **Type:** Radiation from mobile phones (radio frequency radiation) is different from ionizing radiation as till example X-ray radiation. Ionizing radiation may cause cancer due to its high energy (high frequency). This ability has not been demonstrated for non-ionizing radiation (the radiation used in mobile phones). Whether radiation from mobile phones may cause other health effects, i.e. through heating or specific effects on nerve cells, is presently beeing studied.

Extended information (group 2)

- **Absorption:** Possible health effects will depend on exposure time, distance to the radiation source, as well as the amount of energy absorbed by the body. The latter depends on the region of body exposed to radiation and the SAR value of the mobile phone (the lower the SAR, the lower the amount of energy absorbed). Children are possibly more susceptible to radiation than adults because their body is still developing and because their head skull is thinner

Extended information (group 2)

- **GSM-UMTS:** Radiation from third generation (3G) mobile phones and their base stations and radiation from the types used up till now (2G, GSM) are very similar. 3G does, however, use slightly higher frequencies than 2G, and the radiation varies over time in a different pattern. It is not clear whether this has any implications related to human health.

Brief information with precautionary advice (group 3)

- All wireless communication emits radiation similar to radiation from mobile phones. Consider your need for wireless communication in your home. Remember that mobile phones and other communication equipment emits radiation when it is not turned off.
- Compare the SAR values when buying a new mobile phone. The SAR value is a measure of the energy from radiofrequency radiation absorbed by the body (the lower the SAR, the less absorbance).

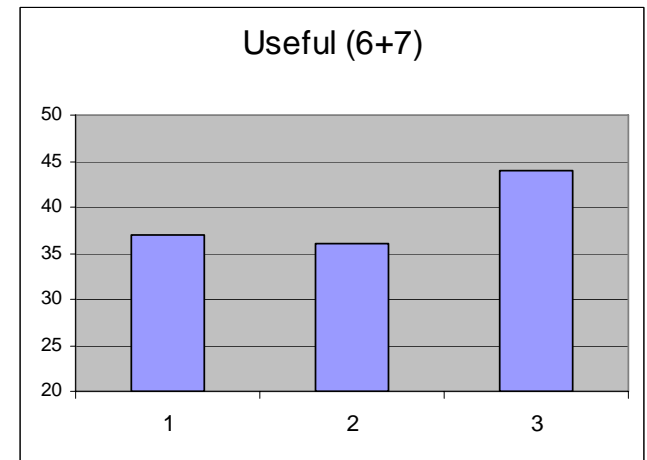
Brief information with precautionary advice (group 3)

- Use head set by longer mobile conversations
- Reduce the length of conversations.
- Avoid conversations on the mobile phone if conditions are sub-optimal
- Set limits for your children's use of mobile phones
- Use text messages (SMS) in stead of conversations

Evaluation of information on radiation from mobile phones

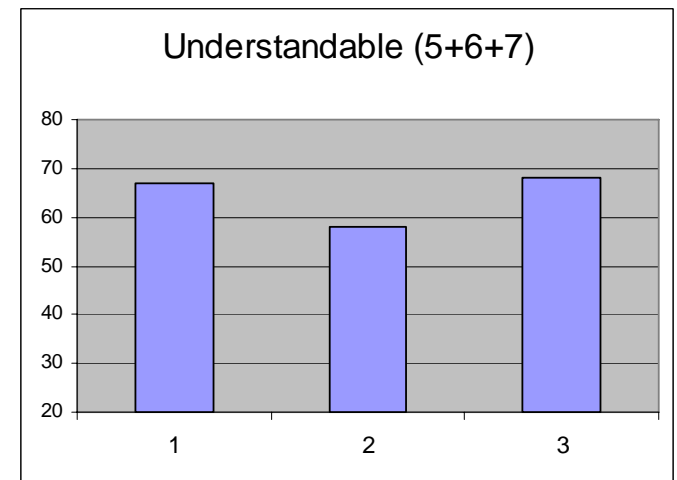
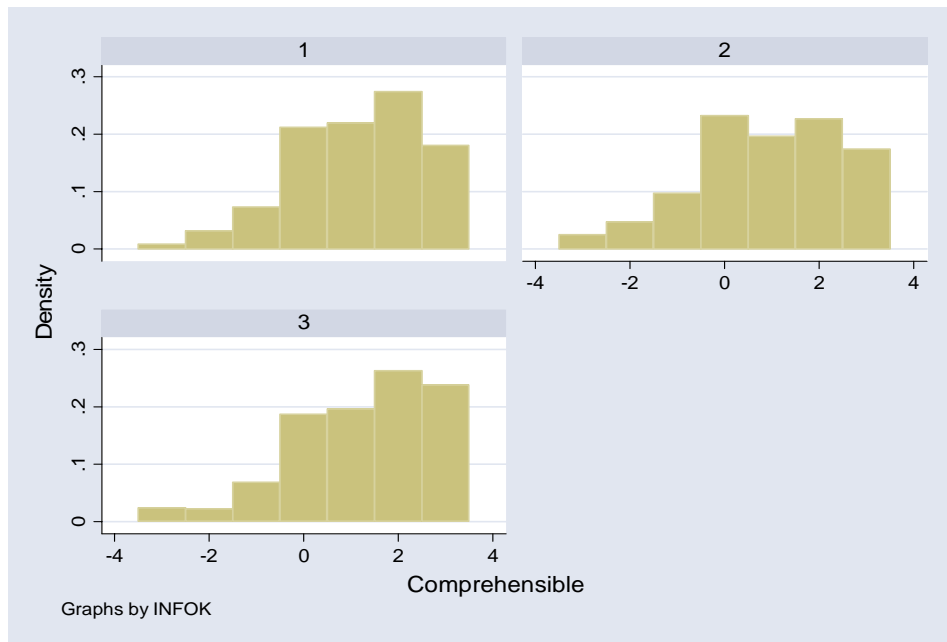
- I can use this information
 - I find this information informative
 - I can understand this information
 - I find this information reliable and credible
- (1 = completely disagree;
7 = completely agree)**

I can use this information



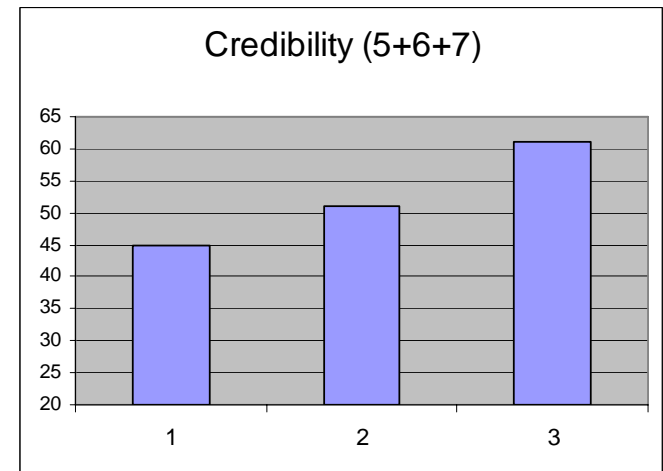
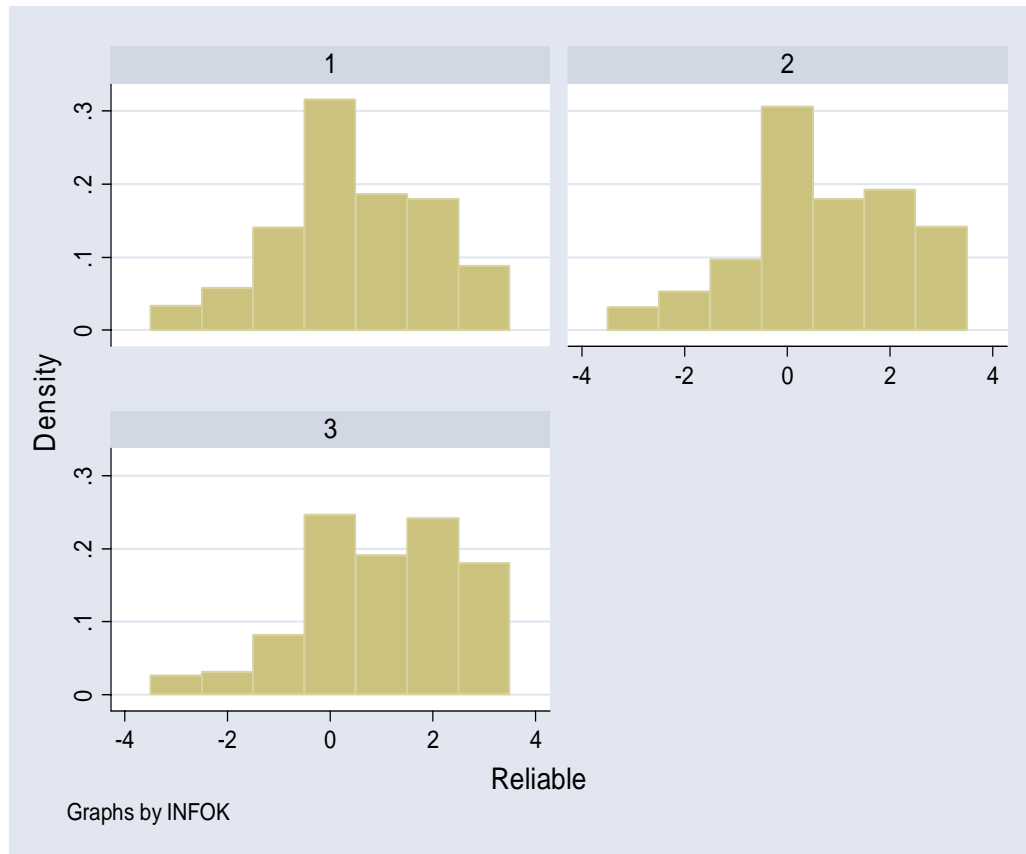
Information 3 is seen as more USEFUL than both 1 and 2 ($p < 0.001$). There is no significant ($p > 0.05$) difference between information 1 and 2

I can understand this information



Information 3 is seen as more easy to understand than information 2 ($p < 0.0001$). Information 1 is seen as more easy to understand than information 2 ($p = 0.0147$). There is no significant difference between groups 1 and 3 ($p = 0.0863$).

I find this information credible



Information 3 is seen as more credible than information 2 ($p=0.0006$) as well as information 1 ($p<0.0001$). Information 2 is seen as more credible than information 1 ($p=0.0058$)

Change in acceptance of new base stations

	Gr. 1	Gr. 2	Gr. 3
Unchanged	301 52.8%	269 49.3%	271 47.5%
Reduced acceptance	128 22.5%	151 27.7%	183 32.0%
Increased acceptance	141 24.7%	126 23.0%	117 20.3%

Change in concerns

	Gr. 1	Gr. 2	Gr. 3
Unchanged	53.5%	51.6%	46.2%
Reduced concerns	24.2%	17.0%	18.0%
Increased concerns	22.3%	31.3%	35.7%

Information changes your own mobile-behavior?

	Gr. 1	Gr. 2	Gr. 3
Unaffected	88%	87%	80%
More certain	1%	1%	2%
Reduced use	5%	6%	9%
Stop using mobile phone	1%	0%	0%
Use head-set	5%	6%	8%

Conclusions

- Concerns about mobile phone radiation are limited, but a few are quite worried
- Considerable proportions expose themselves to the only well documented mobile phone risk
- Source of information may influence trust in information
- Brief advice may be considered more useful, understandable and credible than more lengthy technical information