

## LETTER TO THE EDITOR

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Dear Sir,

### Perceived risk of cancer in population samples from 5 European countries

Understanding and perceiving risks is a major issue for any health education and preventive intervention (Zeckhauser and Viscusi, 1990; Hertz-Picciotto, 1995). However, comparing risk assessment and risk perception is subject to substantial error (Trichopoulos, 1996; La Vecchia et al., 1999). To address these issues using a systematic and quantitative approach, we have conducted a survey on belief, perception and behaviour of cancer risk in the general population of 5 European countries: Belgium, France, Italy, Portugal and Spain.

The study sample was selected from telephone lists in strata of geographic area; over 95% of European households have a telephone. During September 1998, a total of 65,000 households (13,000/country) were sent an anonymous questionnaire (pre-tested in a pilot phase), requesting a reply by subjects aged 16 or over (20 or over in France). A total of 5,579 valid questionnaires was obtained (3,202 females and 2,377 males). No reminder was sent. Only basic demographic information was available from non-responders. The sample of respondents over-represented women, younger age groups and subjects with higher education. Consequently, direct standardisation was used to correct for these factors. The questionnaire included a general section on perception of risk of death and of selected diseases, such as cardiovascular disease, accidents, infectious diseases and cancer. Information was specifically collected on perception of risk and related behaviour for 16 major recognised or potential risk factors for cancer (La Vecchia et al., 1999). For each factor (e.g., "avoiding smoking"), 3 replies were included in the questionnaire for belief (yes, no, I do not know) and 2 for behaviour adoption (yes, no).

Table I gives the percent population perceiving (belief) or adopting (behaviour) selected measures to reduce cancer risk, ranked according to belief on the overall data set. Avoiding smoking ranked first according to belief (96.8%) but third (after reducing alcohol and limiting exposure to sunshine) according to behaviour. The second rank according to belief, before alcohol, was limiting exposure to sunshine (92.2%). The fourth and fifth ranks were limiting exposure to UV radiation and avoiding consumption of pesticide-treated vegetables and fruit (74.4%), and a surprisingly high score was given to extremely low-frequency electromagnetic fields (65.3%).

A smaller relevance was given to selected nutritional and dietary factors, such as avoiding overweight (59.1%) or excessive calorie intake (51.6%), which was believed to be as important as avoiding genetically modified foods (51.2%). Other measures with no documented impact of cancer risk also showed appreciable proportions of belief, including avoiding using cellular phones (39.6%), avoiding microwaved foods (34.3%) and using food supplements (29.4%). These were also the factors with generally larger between-country variation (e.g., between 57.8% in Italy and 26.3% in France for cellular

phones), in the absence, however, of any single and consistent pattern (La Vecchia et al., 1999).

With reference to behaviour adopted, 64.1% of respondents reported limiting alcohol drinking, 61.5% limiting exposure to sunshine and 60.9% avoiding smoking. Most other items ranged between 30% and 45%. Between-country variation was, if anything, larger for several behaviours than for beliefs.

The sample was large enough to provide reliable estimates for most factors considered but over-sampled women, younger age groups and more educated subjects. These potential sources of bias were corrected by direct standardisation, but some residual bias is possible. A non-quantifiable bias, moreover, may have been introduced by the low response rate, which is inherent in the study design.

In conclusion, tobacco and alcohol, the 2 major determinants of cancer on a population level in Europe, were perceived to be major risk factors (Sutton, 1998; Doll, 1999), though consequent behaviours were adopted by only about 60% of the population. Sunshine exposure is a well-defined but quantitatively smaller cancer risk factor on a population level, but was perceived to be a risk factor by most subjects (English et al., 1997). Other sources of non-ionizing radiation, such as electromagnetic fields, whose role in cancer occurrence, if any, remains largely undefined (Poole and Trichopoulos, 1991; Trichopoulos, 1996; Doll, 1999), appeared to be grossly over-estimated. Most nutritional and dietary factors ranked relatively low as risk factors for cancer, including some of the best established ones (i.e., overweight), whereas the role of food colouring, other food additives or pesticides was largely over-estimated (Ames et al., 1995), thus confirming the uncertainties and difficulties in the process of cancer risk communication and perception (Fischhoff, 1999; Gerrard et al., 1999).

Yours sincerely,

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Grant sponsors: Comitato Consumatori Altroconsumo-Conseur; Italian Association for Cancer Research.

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Received 14 September 1999; Revised 1 December 1999

**TABLE I** – PERCENT POPULATION PERCEIVING (BELIEF) OR ADOPTING (BEHAVIOUR) SELECTED MEASURES TO REDUCE CANCER RISK IN 5 EUROPEAN COUNTRIES (BELGIUM, FRANCE, ITALY, PORTUGAL, SPAIN), 1998

Measure	Total sample				Belgium		France		Italy		Portugal		Spain	
	Belief		Behaviour		Belief %	Behaviour %	Belief %	Behaviour %	Belief %	Behaviour %	Belief %	Behaviour %	Belief %	Behaviour %
	Rank	%	Rank	%										
Avoiding smoking	1	96.8	3	60.9	97.5	69.3	97.8	66.1	96.4	59.1	90.0	70.4	97.4	52.3
Limiting exposure to sunshine	2	92.2	2	61.5	94.3	67.1	95.7	70.5	88.0	53.0	83.6	67.4	95.4	59.6
Reducing alcohol drinking	3	84.0	1	64.1	75.8	61.9	84.0	67.2	86.7	63.6	83.5	69.3	82.0	60.2
Limiting exposure to UV	4	83.2	4	58.7	89.0	67.6	88.2	69.8	78.9	53.7	64.5	50.2	85.7	51.5
Avoiding pesticide-treated fruit and vegetables	5	74.4	8	36.0	78.4	42.2	66.2	37.0	82.6	39.0	64.5	42.3	73.8	27.2
Limiting consumption of food colouring	6	72.9	5	44.8	73.0	46.6	57.6	38.0	84.9	53.5	77.6	54.5	73.7	38.2
Avoiding exposure to electromagnetic fields	7	65.3	8	36.0	56.7	31.5	51.2	31.9	74.9	41.3	54.9	36.1	73.5	34.7
Reducing grilled/smoked food consumption	8	62.3	6	41.8	87.3	64.5	73.5	52.3	65.6	43.3	39.5	28.6	41.4	23.2
Avoiding overweight	9	59.1	—	—	64.2	—	53.9	—	61.2	—	63.5	—	60.7	—
Avoiding excessive calorie intake	10	51.6	10	35.7	60.8	45.9	52.3	40.9	49.1	34.6	56.4	42.4	50.8	26.6
Avoiding genetically modified food	11	51.2	11	34.0	34.4	25.5	47.6	35.8	58.6	40.0	58.9	36.8	48.0	24.4
Eating whole-meal products	12	50.3	12	30.7	69.3	53.5	40.7	27.6	55.8	29.8	57.5	42.4	48.3	27.5
Reducing red meat consumption	13	48.2	7	37.3	50.4	42.0	40.9	34.3	59.7	42.6	51.2	35.4	39.0	32.6
Avoiding using mobile phones	14	39.6	14	22.8	36.2	23.7	26.3	18.3	57.8	31.2	33.4	21.9	32.0	16.1
Avoiding microwaved foods	15	34.3	13	28.4	27.8	24.3	27.7	24.0	36.0	29.3	44.5	39.5	40.0	31.4
Using food supplements	16	29.4	15	17.4	29.6	19.3	26.8	18.2	33.8	17.3	41.8	23.4	23.4	14.8

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