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The Institute was set up for the purpose of strengthening, through its own research and analysis, the foundations of the research advisory system and the basis for research policy decisions.

The Institute is responsible for carrying out both basic research and long-term competence-building, together with more practical-oriented analyses and investigations.

Science and Society

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Foreword

In 1996, the Danish Parliament, Folketinget, decided to establish an independent research institute to study and publish analyses of the interplay between scientific research and development and the Danish society. One of the reasons for this decision is that the Danish Parliament assigns increasing importance to knowledge and research as Danish raw material for the future Danish society. Since it was established in May 1997 as a governmental research institute affiliated with the Ministry of Research and Technology, The Danish Institute for Studies in Research and Research Policy has completed a series of surveys and analyses, focusing on the role of scientific research in Denmark. The Institute's reports have all been published and are widely circulated. They have created debate in the public, in the media and among politicians responsible for Danish research policy.

One of the first projects carried out by The Danish Institute for Studies in Research and Research Policy was a study on the Danish population's attitude to science and research, including questions about the Danes' actual level of information regarding scientific research. The data for this project consist primarily of an extensive nationwide survey. The interviews of a representative sample of the Danish population were conducted in October and November 1997.

In addition to this survey, the Institute has completed a broad study of the major Danish newspapers' coverage of research. The media study was primarily based on a systematic content analysis of the five large national Danish morning papers from April to July 1997. In 1999, the Institute conducted a comprehensive study of Danish TV-news coverage of research and development as an addition to the above-mentioned study. Between 1998 and 2000, the results of the surveys were published in five reports from The Danish Institute for Studies in Research and Research Policy.

This publication presents the main results from the five reports, so far only published in Danish, and consolidates the findings from the population study with the newspaper and the TV-news study. It is our hope that this publication will contribute to the understanding of the Danish people's and the Danish media's perception of scientific research and development. At the same time, the report is an invitation to international comparisons in this area. A brief comparison with data from Eurobarometer is thus presented in this report.

This publication is co-authored by Karen Siune and Thomas Vinther, who are also authors of the series of Danish reports on the population study and the media analysis.

Århus, May 2000
Karen Siune, Director

Content

The Danes, the media and research

The Danes' attitude to scientific research and their knowledge of research together with the media coverage of this field are two very central areas in the effort The Danish Institute for Studies in Research and Research Policy has invested in the study of the relationship between research and society.

The first object of this report is thus to describe the Danes' attitude towards scientific research and their knowledge of research, and to explain their attitudes.

The second object is to describe newspaper and TV-news coverage of research. This is a relevant subject in itself, but media coverage can also be perceived as an important factor of great relevance for people's knowledge of and attitude towards scientific research.

The institute's work has so far only shortly equated people's knowledge of and attitude towards research with media coverage of this area, but that topic will be further investigated in the future.

The report first presents the results from the extensive surveys. Among other things, this part of the publication will deal with the Danes' interest in research, their knowledge of research, and also their attitude towards a number of questions related to research and research policy.

Next, the report conducts a comparison with other Europeans, their attitudes and their sources of information.

The focus then shifts to Danish newspaper and TV coverage of research. Among other aspects, this section will investigate what research areas newspapers and TV cover most often and how they cover them.

The conclusion sums up the results of the citizen study and the media study.

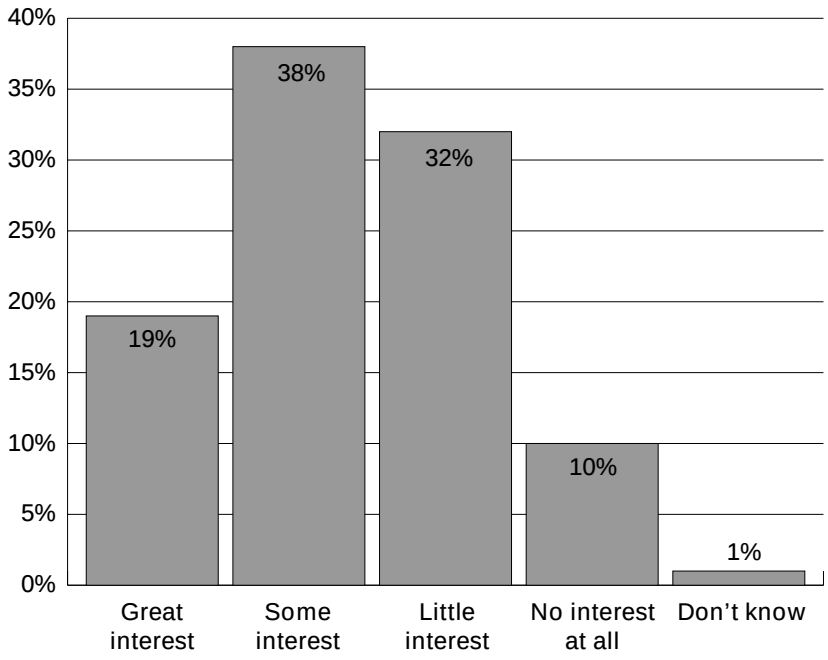
Danes are interested in research

An important part of the interplay between scientific research and the Danish population is the question of whether Danes are interested in research at all.

In 1997, about 50,000 Danes were involved in research of one kind or another, according to the public statistics on research. The number of Danes involved in research activities has increased steadily over the years. Nevertheless, a limited percentage of the citizens are in daily contact with research, even though many of the products we consume in our everyday life are results of research and development. Are Danes, in spite of this limited personal involvement, generally interested in research? This and other questions were presented in interviews with a representative sample of 1400 Danes, aged 16-85.

Figure 1 illustrates the Danes' interest in research.

Figure 1: The Danes' interest in research.

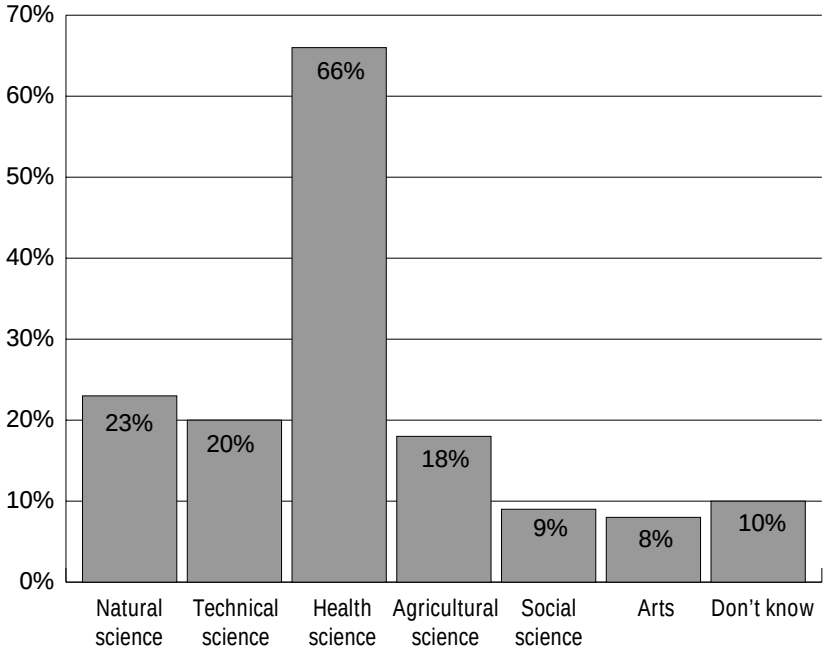


The figure shows that Danes are generally interested in research. 57 percent of the Danish population state that they are either very interested or have some interest in research. Only ten percent state that they have no interest in research at all, 32 percent have only little interest, and very few respondents, about one percent, answered 'Don't know'.

Both Danish women and men state their interest in scientific research; however, more men than women say they are very interested in research. Interest in research varies with age: The very young people and the oldest are less interested in research than the large middle-aged group. The survey material also shows that interest in research increases with the respondents' level of education.

Figure 2 illustrates which research areas Danes are interested in.

Figure 2: The Danes' interest in research areas.



66 percent of the respondents state an interest in health science. No other research area attracts this much interest: natural science is next at only 23 percent. 'Social science' and 'Arts' interest the Danes least: Nine percent mentioned social science, and only eight percent mentioned 'arts' or an area within the broad field of 'arts' which, in the Danish university structure, traditionally includes language, art and history among several other research areas. Agricultural science was mentioned by 18 percent of the respondents, technical science by 20 percent. 10 percent answered 'Don't know'.

Since the phrasing of the question allowed the respondents to mention more than one research area, the numbers do not equal 100 percent.

Men are distinctly more interested in natural science and technical science than women. More women than men are interested in health science, but men also expressed a higher interest in health science than in any other research area.

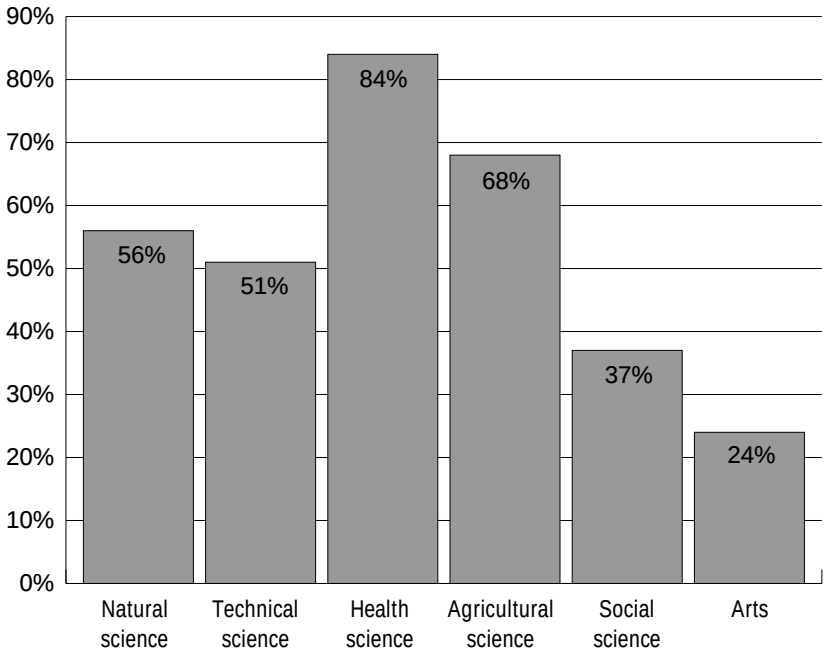
Only respondents with higher education expressed a particular interest in social science and arts.

Danes know a lot about health science

One aspect is interest in research, another is knowledge of research. To what extent are Danes aware of what the different research areas actually study? We asked the respondents to mention examples of research projects within each of the six research areas: natural science, technical science, health science, agricultural science, social science and arts.

Figure 3 illustrates the percentage of Danes who were able to mention a correct example within each of the six main areas.

Figure 3: Able to mention a correct examble.



There are large differences among the different research areas: 84 percent of the population are able to mention one correct research project within health science. At the other end of the scale, only 24 percent are able to mention one correct research field within arts. It is maybe slightly surprising that as many as 68 percent are able to mention one correct research field within agricultural science. When it comes to technical science and natural science, every other Dane between 16 and 85 years of age is able to mention a correct example, while only about every third is able to mention a correct example within social science.

There appears to be a clear connection between interest in a research area and knowledge about it. Men especially are able to mention correct examples of research projects within natural science and technical science; Danish women are a touch better than Danish men when it comes to mentioning a correct research project within health science. Not surprisingly, it appears that higher education goes with greater knowledge of research activity, independent of discipline.

Knowledge of research can, as just indicated, be measured as the population's ability to mention correct examples of projects within each research area, but it can also be measured as the sum of correct answers given by each respondent on the whole series of questions about research within specific areas. This makes it possible to construct an index, which illustrates each person's total knowledge of what the research consists of within the different research areas.

Table 1 illustrates the connection between gender and index.

Table 1: Total knowledge of research, according to gender. Percent

Correct answers	Male	Female	Total percentage
0	5	6	5
1	11	15	13
2	19	19	19
3	17	22	20
4	17	15	16
5	19	14	16
6	12	9	11
In all	100	100	100
Total	705	692	1397

In general, men are slightly better than women at giving examples of research within different areas of science. The share of five and six correct answers is larger among Danish men than among Danish women.

Moreover, especially the 20-29 year-olds and people with a higher education have a high score on the research knowledge index.

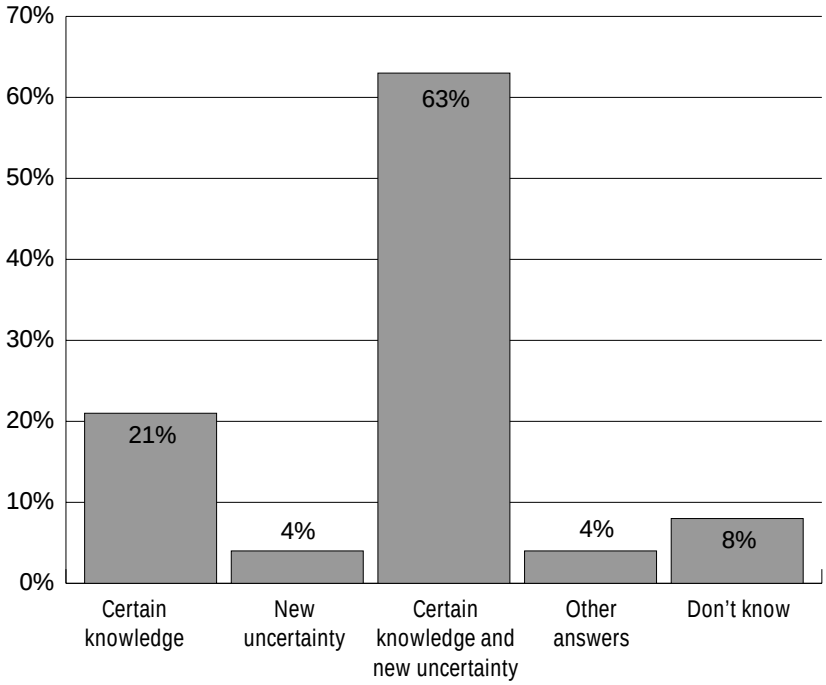
Danes generally feel confident about research

This part of the report will focus on different aspects of the Danes' attitude towards scientific research. How do they perceive research, in particular with respect to feelings of certainty and safety in connection with research?

Citizens' attitudes to science and R&D are important issues in a time of rapid social changes. Uncertainty and taking risks are essential elements in a so-called »risk-society«, German sociologist Ulrich Beck's label for the post-modern world. In a time with debates on animal cloning; uncertainty about the environmental development; growing attention to globalisation and uncertainty about problems connected with the rapid globalisation process, what are the Danes' attitudes to researchers and research in general?

Basically, the majority of Danes express that they feel very safe and confident about Danish research. The answers to the question whether Danish research activity leads to certain (true/safe) knowledge or new uncertainty, or a combination of the two, are illustrated in figure 4.

Figure 4: The Danes' confidence in research.



As illustrated in the figure, a significant majority answers that research in general leads to both new certainty and new uncertainty. However, 21 percent answer that research leads to certain knowledge, and only four percent answer that research only leads to new uncertainty. Eight percent answered 'Don't know', which is a very small percentage, considering the relatively abstract question.

Women are more sceptical than men, which is not specific to Denmark. An analysis of the influence of education shows that the higher education the respondent has, the greater the frequency of the response 'Certain knowledge and new certainty'.

Great confidence in Danish researchers

The next step in the analysis of the Danes' perception of research and risk is to look at the extent of the Danes' confidence in researchers and to compare this with the degree of confidence in other professions.

Table 2 illustrates the extent of the Danes' confidence in researchers and other professions.

Table 2: Confidence in researchers and other professions*

Professions / institutions	Average	n**
Researchers	7.3	1379
Members of Parliament	4.4	1386
Police	7.5	1388
Court of justice	7.2	1381
Medical doctors	7.2	1394

** The respondents were asked to express their confidence on a scale from 0-10.*
***The number of respondents who gave an answer within the scale.*

As the table shows, confidence is homogeneous in all categories, with one characteristic exception: The Danes have confidence in many things, but not in Members of Parliament. In connection with this topic, we should mention that a majority of Danes, 60 percent, believe that researchers 'To a very large extent' or 'To a rather large extent' are capable of drawing the line between appropriate and inappropriate research.

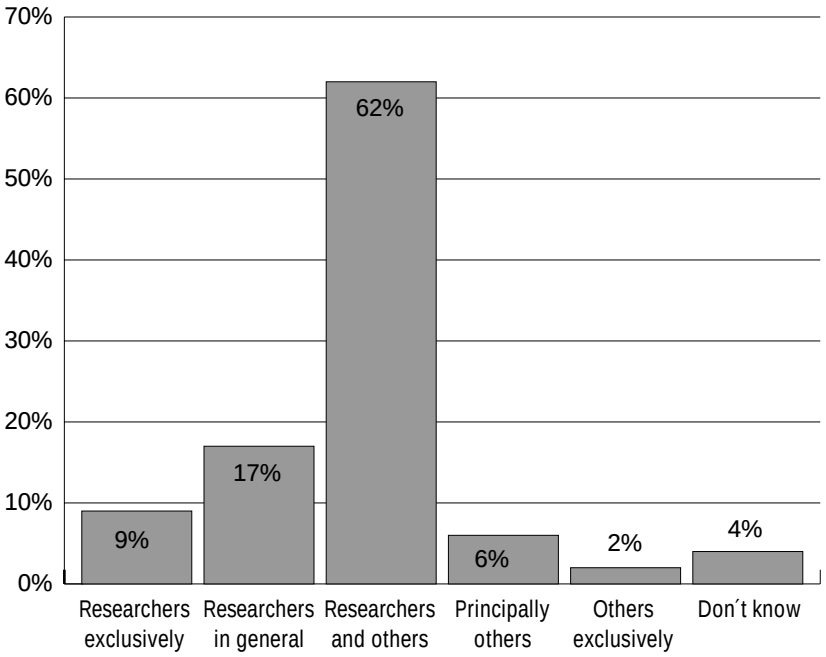
As to which research areas the respondents had in mind when answering this question, health science and agricultural science dominate. When it comes to health science, all categories of confidence are represented, while agricultural science is mentioned especially by people who feel insecure - perhaps due to recent debates about animal cloning.

Who should decide about research?

In continuation of the questions on the Danes' confidence in researchers, a series of questions on research politics comes into prominence. One of the basic questions is, who gets to decide which areas researchers should focus on.

Figure 5 illustrates the answers given to this question.

Figure 5: Who should decide what researchers work on?



The vast majority, 62 percent, believes that researchers in co-operation with others should determine research areas. However, nine percent believe that researchers exclusively should decide, and 17 percent believe that researchers in general should decide. Only two percent state that others should principally decide.

More women than men (66 percent compared to 59 percent) are of the opinion that researchers in co-operation with others should decide on research areas, while 12 percent of the men compared to six percent of the women think that researchers should decide exclusively.

Older Danes differ clearly from younger Danes: More than any other group, at 19 percent, they believe that researchers should principally decide on research areas. In the other age groups this response was given by six to 11 percent of the respondents. Younger people are, to a high extent, of the opinion that researchers in co-operation with others should determine research areas. Respect for the researchers' authority is more pronounced among older Danes.

The respondents' level of education is not a decisive factor.

Different actors must be involved in the choice of research areas

Respondents who expressed that others besides researchers should decide on research areas were also asked which of the groups listed below should be involved in the choice of research areas.

Table 3 illustrates the answers from men and women. Since it was possible to choose more than one group, the numbers in the table do not equal 100 percent.

Table 3: Involvement in choice of research areas, according to gender. Percent

	Male	Female	Total percentage
Researchers within the same area	61	68	65
The management of the research institute	64	60	62
Elected councils	73	70	72
Parliament or the government	44	37	41
The national trade union or trade unions	14	12	13
Private companies and employers' associations	41	33	37
The population as a whole	51	60	56

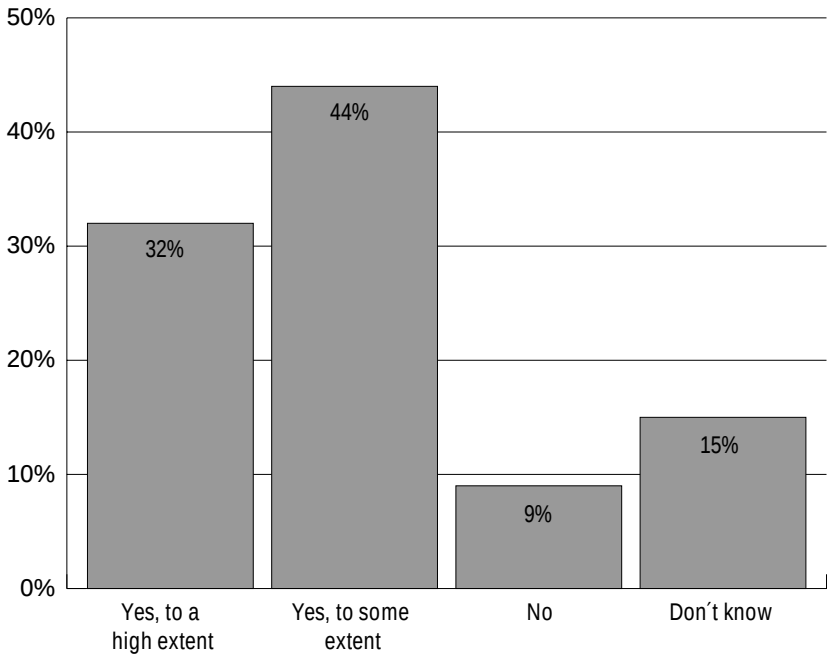
The table illustrates wide support for influence by elected councils and organs, e.g., the Danish National Research Councils, on what each researcher should work on. Likewise, the population supports influence by other researchers within the same area and the management of the research institute. Only 13 percent of those who stated that others should have influence on research areas find that the trade union should participate in the decision. 56 percent of the respondents answered that the population as a whole should have some influence on research areas; 41 percent said the same for Parliament; and 37 percent felt that private companies should have influence.

There are certain gender-related differences concerning this question. More men than women find that Parliament and private companies should have influence. On the other hand, more women than men find that other researchers and the population as a whole should have influence on the research agenda.

Danes find that research can solve problems

Before the next section on funding for Danish research, we will look at whether people believe that research can help solve the Danes' problems.

Figure 6: Can research solve the Danes' problems?



The level of confidence is high: 76 percent answered that research either to a high extent or to some extent can help solve the Danes' problems. However, the 'Don't know' percentage is also rather high.

If we look at what problems people have in mind, it is, once again, clear that health science is the dominating area. More than 67 percent fall within the categories 'Cancer' and 'AIDS/ HIV' or 'Other health science'. Therefore, when people think of problem solving in connection with research, it is mostly medical problems they think of.

The only other problems mentioned by a significant share, seven percent, are environmental problems.

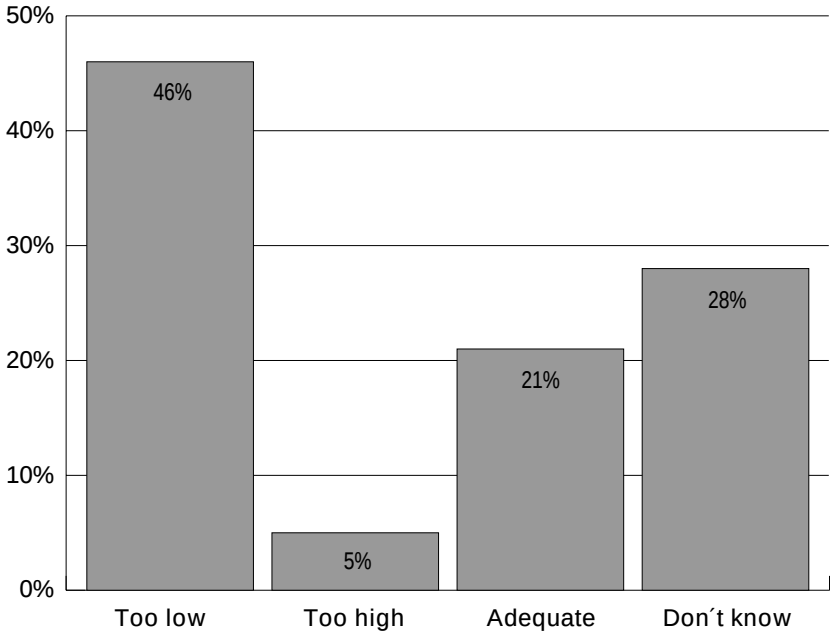
Citizens' opinion: Danish research is underfunded

The Danes' great confidence in the ability of research to solve problems can be expected to influence their attitude towards funding for research.

The question of the consumption of money is in itself very important, but it also has a series of implications on other areas in the research policy-based system. In the long term, one could imagine that great exposure to information about specific research, and from that increased knowledge of a given research area, might give certain research areas better conditions in connection with allocation of funds. Therefore, this issue must be seen in connection with media coverage of research.

Figure 7 illustrates the respondents' answers to the question of whether funding for Danish research is too high or too low.

Figure 7: Funding for Danish research?



Nearly half of the respondents find that funding for Danish research is inadequate. Only five percent believe it is too high, 21 percent find it adequate, and 28 percent answered 'Don't know'.

51 percent of the men compared to 42 percent of the women find that Danish research is underfunded. More women than men answered ‘Don’t know’.

Those who think that Danish research is underfunded were subsequently asked to explain which research areas this applies to.

Table 4 illustrates the answers according to gender. Since it was possible to mention more than one research area, the figures in the table do not equal 100 percent.

Table 4: These research areas are underfunded, according to gender. Percent

	Male	Female	Total percentage
Natural science	31	26	29
Technical science	30	14	23
Health science	63	74	68
Agricultural science	24	16	20
Social science	19	13	17
Arts	15	10	13

68 percent of those who answered that Danish research is underfunded mention health science. Natural science is mentioned by 29 percent, while arts, as an example, are only mentioned by 13 percent. Between 17 and 23 percent mention the other areas.

Again, especially women focus on health science. Research in health science is also the dominating area among men, but less so than among women. However, twice as many men as women find that technical science is underfunded.

The higher education, the higher tendency towards the opinion that funding for Danish research is inadequate. Among respondents with a high school education, 53 percent find that Danish research is underfunded, compared to 37 percent of those with seven years of education or less.

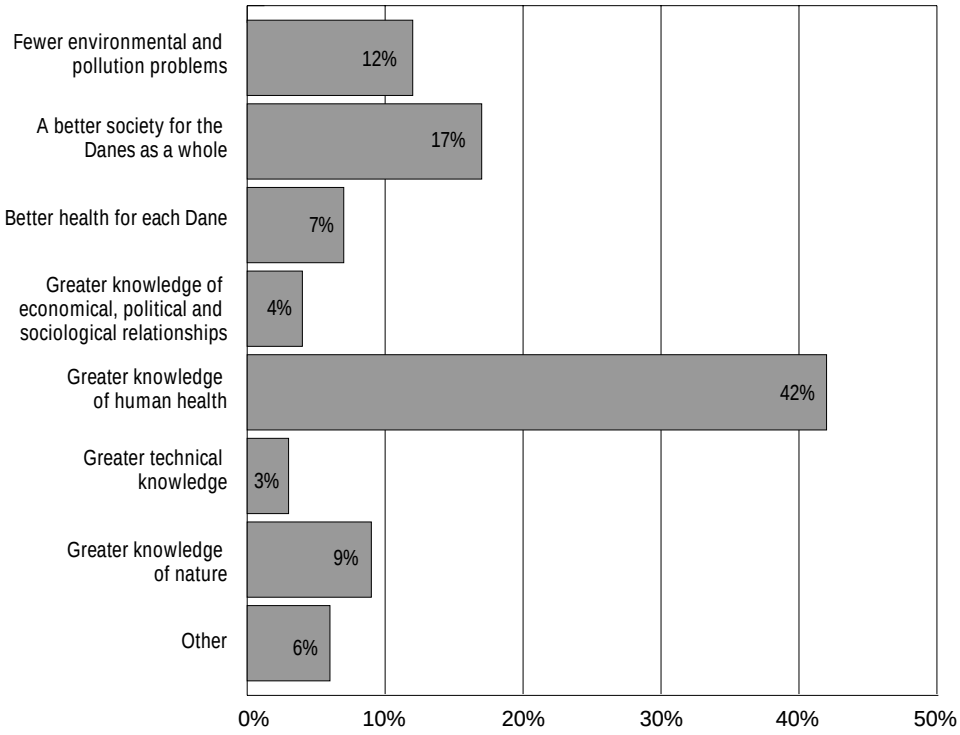
Likewise, the respondents’ confidence in researchers is an important factor in the question of funding for Danish research. Among respondents with high confidence in researchers, 60 percent believe that funding for Danish research is inadequate, compared to 30 percent of respondents with low confidence in researchers.

There is a clear connection between the financial questions and the questions concerning whether or not research leads to true/certain knowledge or new uncertainty. 52 percent of those who find that research leads to certain knowledge say that answer Danish research is underfunded, compared to 34 percent of the respondents who believe research leads to new uncertainty.

Human health is the most important research task

What do the Danes consider to be the most important task for scientific research? The answers are illustrated by the figure below.

Figure 8: The most important research task?



The figure once again shows that the all-important focus is on human health and with that health science. 42 percent of the respondents answered 'Greater knowledge of human health' when they were asked to fix an order of priority of the most important research tasks. The related category 'Better health for each Dane' was chosen by seven percent.

This report draws a clear pattern. Health science is the area to which the Danish population pays the most attention. It is the area the Danes have most knowledge of, it is the area they express greatest interest in, the area they believe is most qualified to help solve some of the Danes' problems, and the research area Danes find most underfunded.

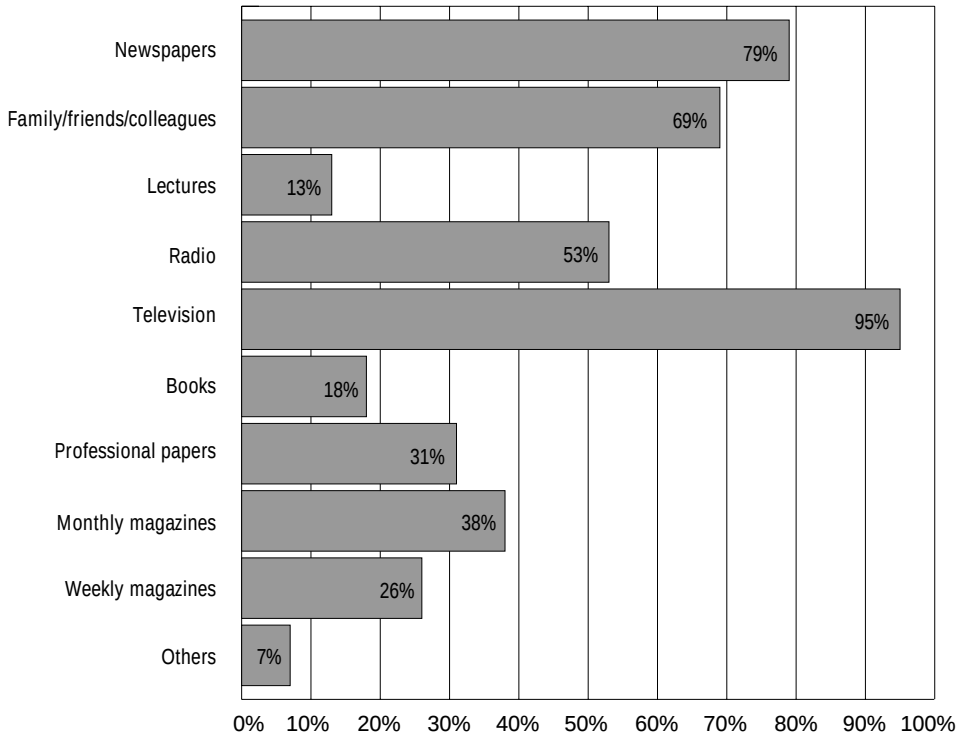
Next in the order of priority is ‘A better society for the Danes as a whole’, followed by ‘Fewer environmental and pollution problems’. Only a few people mention the remaining options. It is worth noticing that a very low percentage answered ‘Don’t know’ (not illustrated in the figure), and only 2 people (0 percent) believe that research is of no use at all. The Danes are generally of the conviction that research has important tasks to solve.

Danes get most of their information from television

The first part of this report introduced a series of questions on the Danes' attitude towards and knowledge of different research areas. The second part will focus on where people get their knowledge and opinion of research, and will present a detailed analysis of Danish newspaper and TV-news coverage of scientific research.

It is a known fact in media research that the messages newspapers and television communicate have a great impact on how people view and understand certain phenomena and areas. An investigation of where people get their information about research from, in connection with a content analysis of newspaper and TV-news coverage of research, is therefore an important part of the effort to uncover the relations between research and society.

Figure 9: The Danes' source for knowledge about sicence.*



**The numbers in the figure do not equal 100 percent, since it is a theoretical possibility and established empirically that an individual uses more than one source to obtain knowledge of research.*

First, people were asked about their sources for information about research. The different sources in the figure below were part of the question. An answer in the category ‘Other’ required a further elaboration.

Television is the most frequent source of knowledge about research, mentioned by 95 percent. Newspapers are also an important source, mentioned by eight out of ten Danes. It is no surprise that television and newspapers are mentioned as the primary sources, because both sources carry a lot of news on research, and many people get their daily news from those two media.

The radio was mentioned by roughly every other Dane, and monthly magazines by 38 percent.

Weekly magazines are also among the written media in which the Danes read about research. Research is also something people talk about with others, and 69 percent mentioned conversation with family, friends and colleagues as a source. Scientific papers were mentioned by 31 percent.

13 percent mentioned lectures as a source, while the Internet, which falls under the category ‘Other’, was hardly mentioned at all in 1997 when these interviews were conducted.

Danes often read and hear about research

The majority of the Danes acquire their information about research through television. Now, how often do Danes hear and read about research?

Figure 10: The last time you heard or read about research?

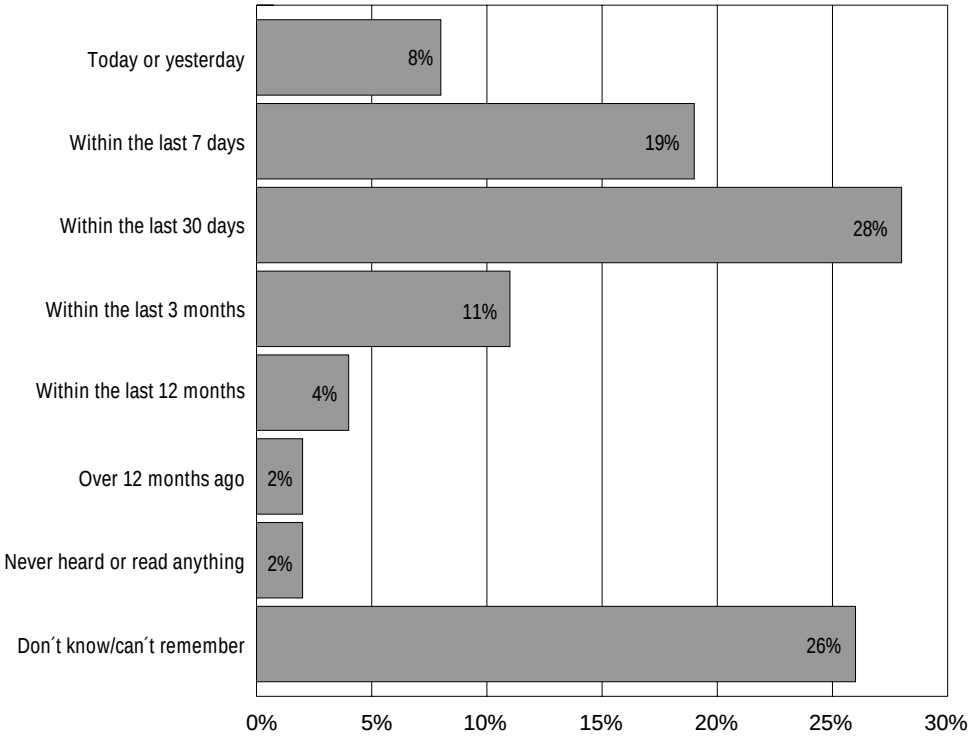


Figure 10 illustrates that more than every other Dane had heard something new about research within 30 days of the interview. 55 percent believed that they had heard about research within the last month, and 27 percent within the last week. Only 17 percent of the respondents believed that it had been between a month and a year since they had last read or heard about research. However, 26 percent answered ‘Don’t know/can’t remember’.

Frequent use of sources leads to more knowledge

According to expectations, the use of different media is an important factor for people's knowledge and understanding of research. An investigation of the connection between use of sources and total knowledge confirms that frequent use of sources leads to more knowledge about research for the majority of the sources. The use of source is surveyed by a series of questions asking the respondents how often they had read or heard about research or research results in the respective media within the last 12 months. Knowledge about research is measured by the index of knowledge, which was described earlier.

Table 5: Total knowledge about research, according to newspaper reading about research. Percent

Correct answers	At least once a week	A least once a month	At least once every third month	Within the last 12 months	Haven't heard/read	Total percentage
0	1	2	3	4	14	5
1	5	11	13	14	21	13
2	12	15	15	31	25	19
3	15	21	25	20	16	20
4	18	19	19	11	14	16
5	24	17	18	13	9	16
6	25	15	7	7	1	11
In all	100	100	100	100	100	100
Total	238	413	189	121	259	1220

The table shows a very clear relation between how much people read about research and how much they know about research. People who often read about research in the newspapers have a greater knowledge of research than those who read about research in the newspapers less often. If this connection is measured statistically, its correlation coefficient is 0.3.[1]

By and large, this relation applies to all the examined sources, except weekly magazines. Table 6 illustrates the correlation coefficient for all seven questions on how frequently the sources are used, arranged against the index of knowledge.

1 In this section, Kendall's Tau-b has been used as statistic measure.

Table 6: Relation between use of source and total knowledge of research

Last 12 months, books or professional papers	0.3*
Last 12 months, monthly magazines	0.2*
Last 12 months, newspapers (daily newspapers)	0.3*
Last 12 months, weekly magazines	0.0
Last 12 months, television or radio	0.2*
Last 12 months, talked to family/friends/colleagues	0.3*
Last 12 months, lectures	0.3*

** Significant on a 95% level of confidence.*

On the other hand, there is hardly any connection between frequency in use of source and attitude towards research. Therefore, the use of sources does not determine whether one believes research leads to certain knowledge, new uncertainty or both. Nor is there a clear connection between frequency in use of source and belief in research as a help to solve some of the Danes' problems.

Active search or passive exposure, great differences in the Danish population

An index in which the respondents are divided according to whether they are actively, socially or passively informed about research has been set up, based on the questions on the frequency in use of different sources to acquire knowledge about research.

The actively informed are defined as people who read books, monthly magazines and attend lectures, while the passively informed are defined as people who hear about research especially through television, newspapers and radio. The socially informed are defined as people who talk to their family and friends about research, but who do not do anything actively besides that.

The point of this section is to take a look at whether different ways of acquiring information about research affect knowledge and understanding, and whether they affect which research areas the respondents are interested in. However, first we need to look at the distribution of social background variables in such an index. In other words, we have to investigate if there are differences in how people inform themselves about research according to gender, age, education and interest.

Table 7 illustrates the connection between gender and index.

Table 7: Ways of acquiring information, according to gender. Percent

	Male	Female	Total percentage
Actively informed	38	35	36
Socially informed	19	19	19
Passively informed	43	46	45
In all	100	100	100
Total	705	692	1397

It was expected that women more often than men are socially informed, but the table illustrates that this is not the case. As many men as women are socially informed. The small gender differences for the actively and the passively informed are not statistically significant on a 95 percent level of confidence.

When it comes to age, there is a certain connection with the index. That is, the youngest and the oldest are, to a higher extent than others, passively informed. Especially the 30-39 year-olds and the 40-49 year-olds actively seek information about research. The socially informed are often found among the 20-29 year-olds and the 40-49 year-olds, but the 16-19 year-olds are also, to a high degree, socially informed about research.

The clear connection between index and education is not surprising. The tendency is that higher education leads to a higher activity in the search for information about research. 55 percent of those with a high school education are actively informed about research, compared to only 23 percent of those with seven years of education or less. In the same way, the people with the lowest level of education are often passively informed. The socially informed are more equally divided between the different education groups; however, there is a small tendency that those with a higher level of education, to a higher degree than others, are socially informed.

Finally, there is the question whether interest in research influences the way people seek information about research.

Table 8 illustrates the connection between interest and index.

Table 8: Ways of acquiring information, according to interest. Percent

	Very interested	Some interest	Little interest	Not interested	Total percentage
Actively informed	69	42	20	7	36
Socially informed	16	22	23	3	19
Passively informed	15	36	57	90	45
In all	100	100	100	100	100
Total	269	524	452	134	1379

As the table illustrates, there is quite a difference in the way of acquiring information according to interest. Those who are very interested are often actively informed, while those who are not interested at all to a high extent are passively informed. The socially informed are often among those who have some or very little interest.

We can conclude that age, education and interest have great influence on how people inform themselves about research, whereas gender makes no difference.

The passively informed are more interested in health science

The first issue is whether the differences in how people seek information influence which research areas they are especially interested in.

Table 9 illustrates the connection between the way people seek information and which research areas they are interested in. Since it was possible to mention more than one research area, the figures in the table do not equal 100 percent.

Table 9: Interest in research areas, according to how people seek information. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts
Actively informed	30	29	61	20	14	13
Socially informed	24	18	68	19	7	6
Passively informed	15	12	69	15	6	3
In all	23	20	66	18	9	8
Total	284	248	817	223	112	95

The actively informed are more interested in natural science, technical science, social science and art than both the socially and the passively informed. The passively informed are more interested in health science than any other group. This pattern is very similar to the pattern that emerges when we look at the different educational groups' interest in the different research areas. Therefore, the above-mentioned connection is controlled for schooling to see whether the connection in fact conceals a large influence by level of education on the two variables.

This analysis shows that many of the differences are retained. However, especially for people with seven years or less of education there are some displacements in relation to the total picture. The differences between the three categories concerning natural science and technical science are therefore heavily reduced for that education group.

The conclusion is that the way people seek information in many ways determines which research area they are interested in, while the educational variable in some cases also influences the connections between the way people seek information and the interest in research areas. Finally, it is important to study cause and effect, since interest in a certain research area may affect how people inform themselves about research.

Active information seeking leads to greater knowledge

As described earlier, frequency in use of different sources is connected to knowledge about research. This section will use this connection and compare the way people seek information and their knowledge about research. It is expected that peoples' knowledge of research is proportional with their activity in search of information about research.

Table 10 illustrates the connection between the active/passive index and knowledge about research.

Table 10: Total knowledge, according to how people seek information. Percent

Correct answers	Actively informed	Socially informed	Passively informed	Total percentage
0	1	4	9	5
1	8	9	19	13
2	13	18	24	19
3	17	23	19	20
4	20	17	14	16
5	21	21	11	16
6	20	8	4	11
In all	100	100	100	100
Total	509	266	622	1397

The table shows a clear connection. The actively informed have considerably greater knowledge about research than the socially and the passively informed. Likewise, the socially informed have greater knowledge than the passively informed. This reading of the table is supported by a correlation coefficient of the connection between the two variables of 0.3.

The connection remains the same when controlled for age and education. All categories of age and education retain a connection between the way people seek information and their knowledge. However, the correlation coefficient falls somewhat when controlled for education. Some of the ways people seek information influence their knowledge and are also influenced by differences in educational levels.

Gender control has not been performed, since this variable earlier proved to have no influence on the way people seek information.

Europeans are interested in and positive towards scientific research

Attitudes towards and knowledge of scientific research have also been studied internationally. Especially the United States has a long tradition for studies in public understanding of science and technology - also called PUS.

Following the American experiences, the European Commission has conducted a number of studies of the European populations and their attitudes towards scientific research.

In this section of the report, the Danish results will be compared to the results from the latest Eurobarometer[2] survey on the public understanding of and attitudes towards scientific research.

Europeans are interested in research

As we have seen, the Danes are very interested in research and, as shown in Table 11, this holds true for all Europeans.

Table 11: Interest in the following news topics. People who say there are very interested. Percent

	Medical discoveries	New inventions and technologies	New scientific discoveries	Politics	Sports
Belgium	36	28	29	21	26
Denmark	39	36	39	41	32
France	58	42	46	25	26
Germany	35	25	26	41	32
Greece	55	44	46	50	27
Ireland	37	30	29	20	39
Italy	45	39	45	22	29
Luxembourg	46	36	37	34	28
Netherlands	57	44	41	35	31
Portugal	29	21	22	12	18
Spain	39	33	37	14	27
United Kingdom	51	39	41	24	28
Total percentage	45	35	38	28	29

2 Eurobarometer 38.1 (1992). Unfortunately, more recent data on the general attitude towards scientific research are not available. The EU conducted surveys in 1996 and 1999 specifically on the Europeans' attitudes towards biotechnology. In the autumn of 2000, the Danish Institute for Studies in Research and Research Policy will conduct a survey on the Danes' attitudes towards research in biotechnology and information technology.

As the table shows, many Europeans are interested in science. The survey actually shows that most Europeans are more interested in science than in sports and politics.

Topic of interest varies with nationality: the French, the Greek and the Dutch are very interested in science, while the Portuguese are least interested.

Medical discoveries seem to generate the most interest among Europeans. This is equivalent to the results from the Danish survey.

Difference in the knowledge of research

The Danish survey measured knowledge of research as the ability to mention a correct example of a research project within the different research areas.

While most Danes were able to mention a correct example within health science, they demonstrated a very poor ability to mention a correct example within social science and arts.

The data in the Eurobarometer survey is not comparable with the Danish data. The knowledge questions in the Eurobarometer survey focus almost exclusively on natural science. This is problematic, because it leaves out questions about Europeans' knowledge about social science and arts.

An alternative way to compare the knowledge of the European populations is to review their level of information about the topics listed in table 11. Of course, this is not an objective measure of knowledge, but it is the best measure available for the comparison. Due to an expected tendency to understate own knowledge - in order not to seem conceited - the following table shows the number of people who answered that they are either 'Very well' or 'Moderately well' informed.

Table 12: Own reporting on knowledge. People reporting to be either very well or moderately well informed about science. Percent

	Medical discoveries	New inventions and technologies	New scientific discoveries	Politics	Sports
Belgium	72	66	64	75	64
Denmark	66	62	60	89	70
France	89	79	79	86	70
Germany	65	54	54	91	67
Greece	80	68	66	94	58
Ireland	52	44	42	71	70
Italy	73	64	65	79	67
Luxembourg	79	68	70	81	75
Netherlands	82	70	65	87	69
Portugal	55	47	44	58	56
Spain	55	48	45	55	57
United Kingdom	71	63	61	81	71
Total percentage	71	62	61	81	67

Although a large share of the Europeans feel that they are either very well or moderately well informed about scientific topics, they generally feel more knowledgeable about politics and sports than about scientific themes. This contradicts the responses to interest in the different topics.

As the table shows, a majority of the Europeans feel better informed about new medical discoveries than about other scientific issues. Once again, the result on the European level seems to correspond with the results from the Danish survey.

It is apparent that the French, the Dutch and the Greek feel they know a lot about scientific topics. The same three populations also expressed great interest in the topics. Once again, the Portuguese express the lowest level of knowledge about scientific research.

As a crosscheck, the next table shows the share of correct answers to one of the direct knowledge questions related to health science. The respondents were asked whether it is true or false that »Antibiotics kill viruses as well as bacteria«.

Table 13: Knowledge of health science. Percent

	True	False	Don't know
Belgium	67	19	14
Denmark	41	47	12
France	56	28	16
Germany	47	31	22
Greece	67	15	18
Ireland	54	28	18
Italy	72	13	15
Luxembourg	77	12	11
Netherlands	47	38	15
Portugal	62	12	26
Spain	42	25	33
United Kingdom	49	39	12
Total percentage	54	27	19

The correct answer is 'false' and, as the table shows, almost all populations have difficulty answering the question correctly. The Danes and the British followed closely by the Dutch have the highest share of correct answers. The only apparent connection with the answer to this 'objective' knowledge measure and the subjective knowledge measure presented in table 12 is for the Portuguese: Only 12 pct. answered correctly. In Spain and Portugal, 'Don't know' is a very frequent answer to the question.

Positive attitudes towards research

The result from the Danish study showed that Danes in general feel confident towards research. They also feel confident that research can solve their problems. At the same time, Danes have a great deal of trust in the individual researcher. How does this correspond to the data on a European level?

The following table shows how the Europeans answer the question: »Science and technology make our lives healthier, easier and more comfortable.«.

Table 14: Attitude towards research. Percent

	Strongly agree	Agree to some extent	Disagree to some extent	Strongly disagree	Don't know
Belgium	26	50	17	4	3
Denmark	25	61	9	3	2
France	29	55	11	3	2
Germany	33	53	8	2	4
Greece	37	47	9	3	4
Ireland	28	48	10	4	10
Italy	26	54	11	5	4
Luxembourg	31	45	14	4	6
Netherlands	17	68	10	2	3
Portugal	35	41	8	4	12
Spain	33	48	9	3	7
United Kingdom	20	64	10	3	3
Total percentage	28	55	10	3	4

Many Europeans strongly agree that science makes life better. Only 13 pct. disagree to some extent or strongly. These figures indicate that confidence in research is also present at the European level.

Greece, Germany, Portugal and Spain exhibit great confidence in research. The Netherlands, United Kingdom and Denmark are among the countries with the lowest confidence in research measured in this Eurobarometer survey.

How about the Europeans' confidence in the individual researcher?

Table 15: Which of the following professions do you respect the most? Percent*

	Judges	Medical doctors	Lawyers	Scientific researchers	Journalists
Belgium	4	46	3	23	4
Denmark	28	27	5	20	2
France	3	47	1	36	2
Germany	13	41	4	19	2
Greece	5	43	3	23	5
Ireland	11	60	2	10	2
Italy	13	32	2	33	1
Luxembourg	11	54	1	15	2
Netherlands	13	44	1	15	3
Portugal	9	61	3	10	4
Spain	29	36	3	18	2
United Kingdom	4	65	3	13	1
Total percentage	11	45	3	23	2

** Some categories are left out, so the numbers in the table do not equal 100 percent.*

As the table shows, Europeans have great respect for medical doctors and for scientific researchers. Respect for medical doctors is quite overwhelming compared to respect for the other professions listed in the table.

The respondents in United Kingdom, Portugal and Ireland have the highest respect for medical doctors. The Danish respondents have the lowest respect for medical doctors, which is due to a high respect for Danish judges. As it was possible to mention only one profession in this question, the high respect for judges is affecting the figures for respect for medical doctors.

With regard to scientific researchers, the respondents in United Kingdom, Portugal and Ireland have the lowest respect for scientific researchers, while the respondents in France and Italy have the highest. The low figures for the respondents in United Kingdom, Portugal and Ireland can be explained by the high respect for medical doctors. The two professions are quite similar, and while the respondents from these three countries answer medical doctors, they could as well have answered scientific researcher.

On the subject of funding, the Danish survey clearly showed that Danes feel that research is underfunded.

The Eurobarometer survey made the following statement: »Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by government«.

Table 16 shows how the responses from the 12 countries.

Table 16: Government support for research. Percent

	Strongly agree	Agree to some extent	Disagree to some extent	Strongly disagree	Don't know
Belgium	31	46	12	4	7
Denmark	41	40	8	6	5
France	46	40	6	2	6
Germany	27	48	12	4	9
Greece	51	35	2	2	10
Ireland	30	45	8	2	15
Italy	35	47	5	2	11
Luxembourg	33	45	9	2	11
Netherlands	40	44	6	4	6
Portugal	36	33	9	4	18
Spain	40	31	8	3	18
United Kingdom	32	51	8	1	8
Total percentage	35	44	8	3	10

The table shows strong agreement about financial support for research also at the European level. On average, only 11 pct. of the Europeans disagree with government funding for scientific research.

The respondents from Greece and France are most favourable to government support for research, while the respondents in Belgium and Germany are somewhat more reluctant.

Health science is the most prominent research area

The Danish survey showed that health science was the most important research area for a majority of Danes, and that Danes had very little interest in and knowledge of social science and arts.

It is difficult to compare this data with the Eurobarometer data. The European questionnaire focuses on health science, natural science and technical science and asks almost no questions about social science and arts.

This indicates a priority status for health science, technological science and natural science at the European level. This report has previously shown that Europeans have most respect for medical doctors and greater interest in new medical discoveries than in any other topic.

It thus seems that health science - also at a European level - has a prominent status compared to all other research areas.

To substantiate this, the following table shows how the respondents in the European countries reacted to the following statement: »Scientific and technological progress will help to cure illnesses such as AIDS, cancer...«

Table 17: Attitudes towards health science. Percent

	Strongly agree	Agree to some extent	Disagree to some extent	Strongly disagree	Don't know
Belgium	45	40	7	2	6
Denmark	63	29	3	2	3
France	51	38	4	2	5
Germany	42	42	8	3	5
Greece	72	19	2	2	5
Ireland	42	39	3	2	14
Italy	42	42	6	1	9
Luxembourg	47	35	7	4	7
Netherlands	67	26	2	2	3
Portugal	52	26	8	2	12
Spain	59	28	3	2	8
United Kingdom	36	51	6	2	5
Total percentage	47	39	6	2	6

As the table shows, a vast majority of the Europeans agree with this statement. Especially Greece, The Netherlands and Denmark demonstrate a strong belief in the possibilities of health science. Less than 10 percent disagree.

TV most prominent source of scientific information

Before the next section, which summarizes studies of Danish newspapers and Danish TV-news coverage of research, it will be examined how Europeans receive information about research.

It was previously established that Danes get most of their information about research via TV and newspapers.

The following table shows how Europeans get their information about research.

Table 18: Information on research. People who regularly or occasionally get information on research through the mentioned media. Percent

	TV	Newspaper	Scientific Magazines
Belgium	47	37	20
Denmark	60	55	34
France	65	49	26
Germany	51	44	23
Greece	49	35	14
Ireland	49	35	13
Italy	62	46	21
Luxembourg	54	51	26
Netherlands	62	60	19
Portugal	30	19	11
Spain	45	35	20
United Kingdom	77	48	14
Total percentage	59	45	20

Not surprisingly, TV is the most used source for information on research in all countries.

45 percent of the Europeans also get information from newspapers, while only 20 percent read about research in scientific magazines.

In the United Kingdom, 77 percent of the respondents watch scientific programmes on TV. The respondents from the Netherlands are the ones who most often read about research in the newspapers, and the Danes are the ones who are most compelled to read about science in scientific magazines.

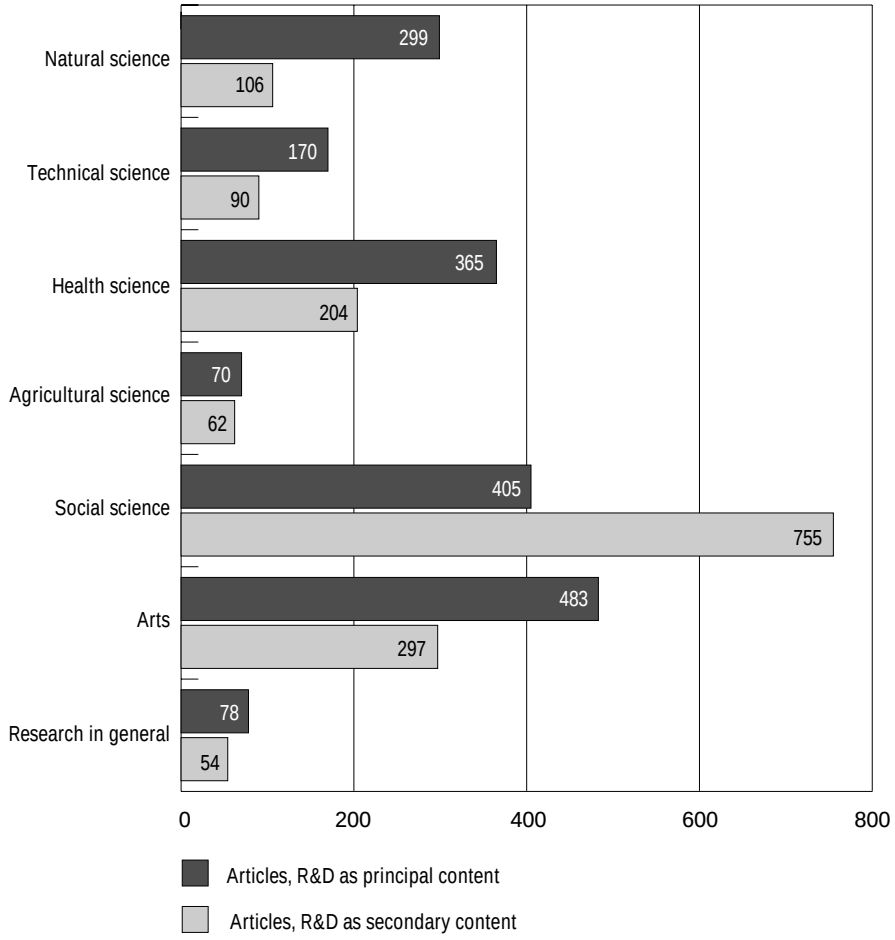
Newspapers publish a lot of social science

Earlier, this report focused on the Danes' understanding of research. The next sections focus on newspaper coverage of research.[3]

First, we have chosen to examine Danish newspaper coverage of different research areas.

Figure 11 illustrates the number of articles with research as principal content or as secondary content,[4] distributed over the different research areas.

Figure 11: Number of articles distributed over research areas.



3 The analysis includes the five large Danish morning papers in the period April 1 to July 1, 1997.

4 Articles with research as principal content are articles in which research make up the whole article; in articles with research as secondary content, research only forms a part of the article.

In total number of articles over a four-month period, social science clearly dominates; it makes up the content of 34 percent of all articles with reference to research. In nearly two thirds of the articles on social science, research was only secondary. Arts follow social science with about 23 percent of the total number of articles. It is rather surprising that social science and arts are so prominent in the newspapers, because social science and arts were the research areas the Danes' had least knowledge of and least interest in.

Health science, which was the dominating research area in the Danes' consciousness, comes in third in the newspapers.

Natural science, technical science, agricultural science and research all generally had lower frequency in the newspapers than the above-mentioned research areas.

As illustrated in figure 11, it makes a great difference whether we focus on articles with research as principal content or articles with research as secondary content. If we just focus on articles with research as principal content, it appears that arts is the dominating research area with 26 percent of the articles, followed by social science, health science, natural science, technical science, features on research in general, and finally agricultural science.

In most areas, articles with research as principal content make up more than half of the total number of articles. Within natural science, 74 percent of the articles have research as principal content. In articles on research in general - arts, health science, technical science and agricultural science - the percentages are between 59 and 65 of the total number of articles. Social science is an odd one: only in 35 percent of all articles on social science is research dominating. If we focus only on articles with research as principal content, the share falls from 34 percent to 22 percent of the total number of articles.

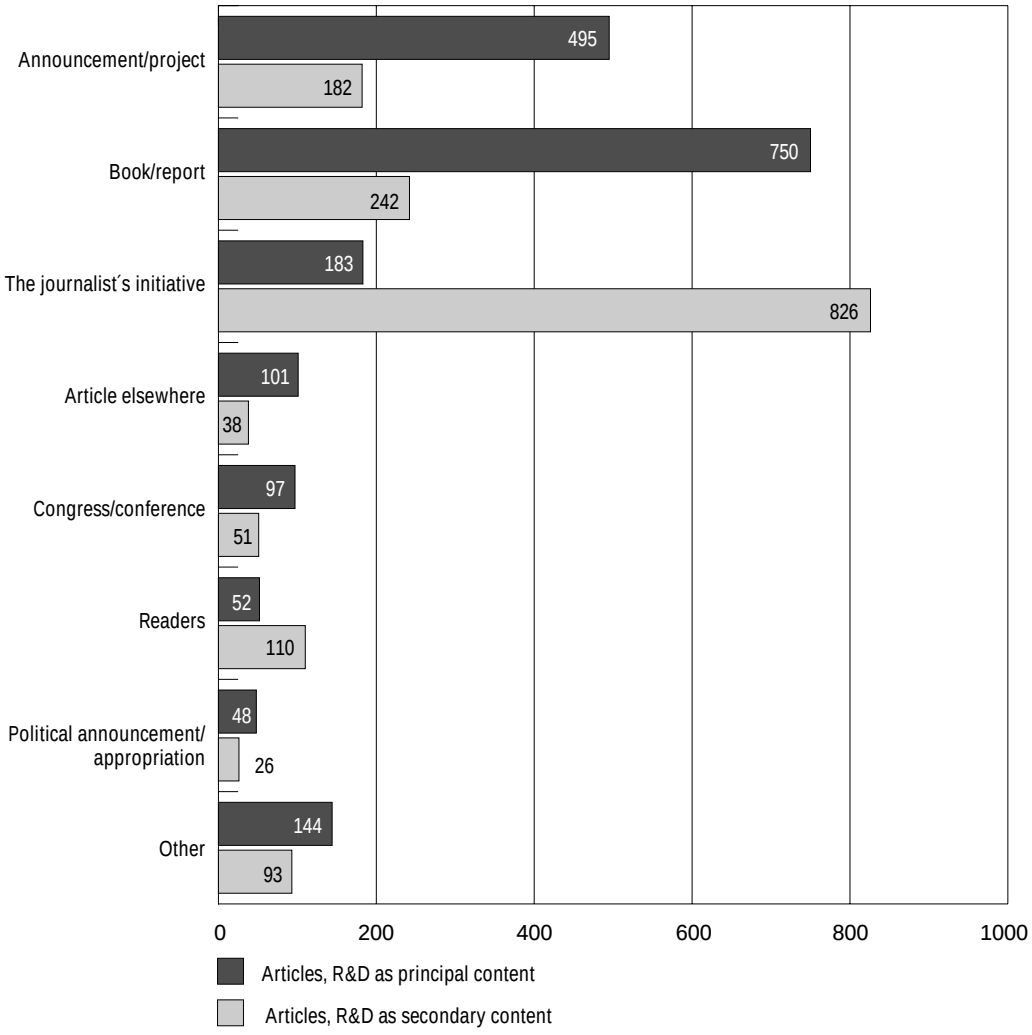
The average length of articles with research as principal content varies from 550 column millimetres for articles about arts to 300 column millimetres for articles about agricultural science, and 440 column millimetres for articles on natural science.

Many different starting points for articles on research

Who and what get research in the newspapers? Is it mainly journalists, researchers or a third party who takes the initiative?

Figure 12 illustrates starting points for coverage of research in newspapers.

Figure 12: Starting point for coverage of R&D, number of articles.



The figure clearly illustrates that when it comes to articles with research as secondary content, journalists often take the initiative. It is no surprise that most articles with research as secondary content are articles in which researchers comment on a given case. Publishing a book, a report or launching new projects are also often starting points for coverage of research in newspaper.

For articles with research as principal content, the starting point is most often a book or a report by a researcher. Another important source is an announcement or a project by a researcher. It is relatively rare that journalists take the initiative to write an article with research as principal content. Conferences and publications elsewhere are, to a smaller extent, starting points for discussions of research; this applies to both types of articles.

References to a book or a report are common

The next question is what the articles on research most often refer to. Table 19 illustrates the connection between research areas and what the articles refer to. Since one article can refer to more than one thing, the numbers in the table do not equal 100 percent.

Table 19: References in articles on research, according to research area. Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
Project	53	61	40	46	11	19	23	32
Book/report	32	24	48	43	71	70	38	53
Article	21	6	19	4	10	8	10	12
Congress	10	6	6	9	4	2	10	6
Political announcement	10	14	4	1	5	5	17	7
Political research organs	1	0	0	0	0	1	9	1
Other	4	7	4	7	7	8	19	7
No references	10	13	9	13	12	10	14	11

The table illustrates that references to a book or a report are most common. 53 percent of all the articles refer to a book or a report. 32 percent of the articles refer to a project, and 12 percent to an article published in another newspaper or another journal. 11 percent of the articles contain no such references.

There is a clear difference between the research areas: Articles on technical science and natural science often refer to projects, while articles on social science and arts typically refer to books or reports. Natural science articles often refer to articles, which does not apply to the rest of the research areas to the same extent. Only articles on natural science, technical science and articles on research in general refer to political announcements in 10 percent or more of the cases. Only articles on research in general refer to research policy organs.

Professors have a platform in newspapers

Table 20 illustrates which researchers make statements in articles with research as principal content, distributed over the different research areas. Since an article may contain statements from more than one person, the numbers in the table do not equal 100 percent.

Table 20: Who makes statements about research, according to research area. Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
Professor	13	7	17	9	16	7	13	12
Senior lecturer/lecturer	11	6	5	6	13	12	8	10
Ph.D./research assistant	3	2	2	3	2	1	3	2
Research manager etc.	7	8	8	11	9	2	3	6
Researcher in specific area	22	8	12	29	17	17	4	16
Researcher in general	5	4	1	6	6	3	1	4
Consultant/doctor	1	2	33	7	0	0	0	7
Engineer	2	8	0	3	0	0	0	1
Manager	3	14	3	0	4	1	5	4
Other	2	3	2	9	2	4	8	3
No statements	44	51	32	36	40	57	63	45

The table illustrates that especially professors have access to newspapers. 12 percent of the articles with research as principal content contain a statement from one or more professors. Only researchers in a specific area make more statements than professors, but this group covers various research groups, e.g., biologists and chemists - all cases where the researcher's title is not mentioned.

In all research areas, professors are involved especially in articles on health science and social science, and to a smaller extent in articles about arts and technical science. Senior lecturers and lecturers are quoted especially within arts, social science and natural science, while managers are often quoted in technical science.

Male researchers get more media exposure than female researchers

The next logical step is to examine whether these statements are made by male or female researchers.

Table 21 illustrates the gender distribution for researchers who are quoted in newspaper articles with research as principal content. Since one article may contain statements from both male and female researchers, the numbers in the table do not equal 100 percent.

Table 21: Gender of quoted researcher, according to research area. Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
Male	48	43	56	54	49	35	27	45
Female	9	9	17	17	13	10	12	12
No statements	44	51	32	36	40	57	63	45

The table clearly shows that male researchers are quoted more than female researchers. 45 percent of the articles contain statements from male researchers, while only 12 percent of the articles contain statements from female researchers. In 45 percent of the articles, there are no statements at all. The gender difference is largely extent due to the fact that there are approximately three times as many male than female researchers in Denmark.

Female researchers are often quoted in articles about health science and agricultural science. Within these two areas, 17 percent of the articles have statements from female researchers. Natural science and technical science are the two areas with the smallest number of statements from female researchers. To some degree, this distinction is reflected in the grouping of male and female researchers in Denmark within the different research areas.

News rather than features about research

Table 22 illustrates the types of articles that discuss the different research areas.

Table 22: Types of articles, according to research area.
Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
News article	57	69	64	66	64	30	47	54
Feature article	1	0	1	2	3	6	1	3
Letter to the editor	10	2	5	7	9	6	17	7
Editorial	1	0	0	0	1	0	4	1
Paragraph	15	25	23	23	9	9	23	15
Feature	10	2	5	1	4	10	3	6
Book review	5	0	2	1	8	32	3	11
Other reviews	0	2	0	0	1	6	2	2
Other	1	0	0	0	1	1	0	1
In all	100	100	100	100	100	100	100	100
Total	299	170	365	70	405	483	78	1870

54 percent of the articles about research with research as principal content are news articles. 15 percent of the articles are paragraphs, while 11 percent of the articles are book reviews. Letters to the editor and features constitute respectively seven and six percent of the articles.

The figures for articles with research as secondary content follow the same pattern as the figures in table 22: 68 percent are news articles, four percent are paragraphs, and 10 percent are letters to the editor.

Differences between the various research areas are very pronounced. Especially arts stand out: Only 30 percent of the articles about arts are news articles, 32 percent are book reviews, and 10 percent are feature articles. In all other research areas, the percentage of news articles is between 57 and 69 percent, except articles on research in general with a 47 percent share. Relatively many letters to the editor and editorials are about research in general, and very few of the paragraphs are about social science and arts.

Not only science journalists write about research

Based on our data, we can only draw a very loose conclusion as to how many and what kind of journalists cover research in the newspapers.

We have registered 453 writers/journalists at different newspapers who have written articles with research as principal content. This relatively large number of writers/journalists shows the wide range of people who write such articles. In this survey, only a few journalists are registered for more than 10 articles. During the survey period, the vast majority of the journalists wrote only one or two articles with research as principal content.

Table 23 illustrates these relations. First, we take a look at the distribution of the individual research area.

Table 23: Number of journalists in each research area, according to gender

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general
Male	62	52	58	13	107	117	8
Female	22	19	43	17	48	72	12
Total	84	71	101	30	155	189	20

As the table illustrates, many different journalists write about arts and social science, while articles on agricultural science and articles on research in general are written by a few journalists. To a very high extent, these numbers are connected with the amount of articles within each research area.

The table also illustrates a pronounced difference in the gender distribution within each research area. In all areas, except agricultural science and articles on research in general, male journalists dominate, especially when it comes to articles about natural science, technical science and social science. There is a more equal gender distribution among journalists who write about health science and arts.

Danish public research is in focus

The content analysis covers all types of research: Danish and foreign, public and private. First, we will examine whether Danish or foreign research is most frequently discussed in the newspapers.

Table 24 illustrates the connection between Danish/foreign research and each research area in articles with research as principal content.

Table 24: Danish/foreign research, according to research area. Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
Danish	46	56	65	86	76	69	80	66
Foreign	42	36	29	14	23	27	15	29
Danish/foreign	7	6	4	0	0	2	4	3
Not specified	5	2	2	0	1	2	1	2
In all	100	100	100	100	100	100	100	100
Total	299	170	365	70	405	483	78	1870

The table shows that Danish newspapers mostly cover Danish research, but that foreign research is also well represented. 29 percent of the articles with research as principal content originate in foreign research, 66 percent in Danish research. Only three percent discuss co-operation between Danish and foreign research, while two percent of the articles do not specify whether they involve Danish or foreign research.

Articles on natural science frequently originate in foreign research: 42 percent involve foreign research, and seven percent co-operation between Danish and foreign researchers. Agricultural science is the most ‘Danish’ research area, while technical science is represented by a relatively large quantity of foreign research. Most articles about research in general focus on Danish research, while social science and art assume a middle position when it comes to the relationship between Danish and foreign research in the newspapers.

The percentages concerning articles with research as secondary content are very similar; however, when it comes to social science, these articles consist of distinctly more Danish research.

Another aspect of Danish versus foreign research is how often international organisations like EU, UN or OECD are mentioned in articles about research. The answer is simple: in general, they are not mentioned at all: Only 2 percent of the total number of articles mention EU, UN or OECD in connection with research. UN is mentioned especially in connection with health science and social science, while OECD often is mentioned in connection with social science and arts. EU is mentioned in articles from nearly every research area, with the exception of arts.

Preponderance of public research

This section first examines how large a part of the research in this investigation is public and how much is private.

Table 25 illustrates the connection between the individual research areas and research sectors, understood as public or private research. The figures involve articles with research as principal content.

Table 25: Public/private research, according to research area. Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
Public	64	39	77	79	73	62	60	66
Private	8	34	7	4	15	5	9	11
Public/private	3	14	3	7	1	1	8	4
Not specified	25	13	13	10	11	32	23	19
In all	100	100	100	100	100	100	100	100
Total	299	170	365	70	405	483	78	1870

Public research dominates in Danish newspapers, even though the private sector, according to research statistics, actually spends more money on research than the public sector. In 1997, the private sector spent DKK 13.3 million and the public sector DKK 8.3 million. In every fifth article, it is impossible to determine whether the research is public or private. It is especially difficult to determine in letters to the editors. Co-operation between the public and the private sector is only pronounced in four percent of the articles.

The most conspicuous element concerning the individual research area is that ‘only’ 39 percent of the articles on technical science deal with research in the public sector. 34 percent deal with research in the private sector, and 14

percent with research co-operation between the public and the private sector. 73-79 percent of the articles on health science, agricultural and social science refer to public research. When it comes to natural science, arts and articles on research in general, it is often hard to determine whether its a case of public or private research.

The figures for articles with research as secondary content are practically identical with the figures in table 25, except that co-operation between the public and the private sector is not as common.

Focus on research from institutions of higher education

In what sector is the research described in the newspapers carried out?

Table 26 illustrates the connection between research areas and sector, understood as institutions.

Table 26: Sector of research, according to research area. Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
Institutions of higher education	35	25	14	37	40	42	45	33
Other institutions of advanced studies	0	0	0	1	1	1	0	1
Hospital/health service	1	2	60	11	0	2	0	13
Libraries/archives	0	0	0	0	0	1	0	1
Museums	2	1	0	0	0	10	0	3
Agriculture	3	0	0	24	0	0	0	2
Other public institutions	8	5	1	7	18	2	0	6
Private persons (not business man/woman)	0	0	1	0	3	0	0	1
Technological service institutions	0	4	0	0	0	0	0	0
Sector research institutions	2	2	1	2	1	0	6	1
Private business	6	39	5	3	9	1	8	8
Other	9	6	4	6	15	7	5	8
Not specified	34	16	14	9	13	34	36	23
In all	100	100	100	100	100	100	100	100
Total	299	170	365	70	405	483	78	1870

33 percent of the research brought in the newspapers is carried out at institutions of higher education, and 13 percent at hospitals/health service. In 23 percent of the articles, it was impossible to determine the sector.

Private business is the sector in eight percent of the articles, compared to six percent of the other public institutions. Research from sector research institutions is only the starting point for one percent of the articles, research from museums for three percent.

If we look at the differences between the various research areas, especially health science and technical science stand out with a noticeably lower number of articles in the category 'Institutions of higher education' than any of the other research areas. The explanation is that a lot of the health science research is carried out at hospitals or in the health sector, while a lot of the technical science research goes on in private businesses. A great deal of the social science research which appears in the newspapers stems from other public institutions.

The figures for articles with research as secondary content form a pattern similar to the one in table 26: 44 percent fall in the category 'Institutions of higher education', and in 19 percent of these articles it was impossible to determine in which sector the research was carried out.

We can conclude that journalist tend to look for researchers at institutions of higher education.

Positive mention of research is prominent

In what 'tone' are the different research areas mentioned?

Table 27 illustrates the extent of positive or negative coverage of the individual research areas.

Table 27: Positive/negative coverage, according to research area. Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
Positive	35	52	30	26	13	33	16	29
Negative	7	4	5	6	7	6	20	7
Positive and negative	22	11	9	12	10	17	24	14
Neutral	36	33	56	56	70	44	40	50
In all	100	100	100	100	100	100	100	100
Total	299	170	365	70	405	483	78	1870

The table shows that coverage is generally positive. 29 percent of the articles are clearly positive about research and development, seven percent are negative, while 14 percent of the articles have both positive and negative references to research. 50 percent of the coverage is neutral.

There is quite a large difference between the different research areas. Technical science is mostly subject to positive comments, while research in general is often subject to negative comments. Natural science was mentioned more often than the other research areas, both in a positive and a negative way. Likewise, arts are often mentioned in articles which have both a positive and a negative attitude towards research. It is also characteristic that 70 percent of the articles about social science refer to research in a neutral way. None of the other research areas are close to having the same amount of neutral articles.

These are the direct attitudes towards current research, but what are the future expectations to research?

Table 28: Expectations to research, according to research area. Articles with research as principal content. Percent

	Natural science	Technical science	Health science	Agricultural science	Social science	Arts	Research in general	Total percentage
Positive	27	52	28	26	7	11	21	21
Negative	3	1	2	3	1	1	7	2
Positive and negative	11	4	4	2	1	3	7	4
Neutral	59	43	66	69	91	85	65	73
In all	100	100	100	100	100	100	100	100
Total	299	170	365	70	405	483	78	1870

Expectations to research are not always obvious in articles. 73 percent of the articles express no expectations, but when expectations to research are expressed, they are very often positive. Only two percent of the articles express clearly negative expectations to research.

Once again, especially technical science is surrounded by positive expectations, while natural science is the subject of both positive and negative expectations. 91 percent of the articles about social science and 85 percent of the articles about arts express no expectations to research.

The figures for articles with research as secondary content put a significantly larger part of the articles in the ‘Neutral’ category. Otherwise, the pattern is the same as for articles with research as principal content, both when it comes to attitude and expectations to research.

TV-news are very positive in their coverage of research

Recently, the Danish Institute for Studies in Research and Research Policy conducted a study of Danish TV-news coverage of scientific research. The study can be seen as complementary to the study of how Danish newspapers cover research. With these two studies, we now have a comprehensive knowledge of how the Danish media cover scientific research.

The television project examined all news items on research on the two main Danish TV-stations, both public service stations, for a period of two months. 57 of a total of 2399 news items, or 2.4 percent, covered research in the examined period.

Table 29 shows the expectations expressed in the news items on the different research areas.

Table 29: Expectations to research, according to research area. Percent

	Positive	Negative	Neutral	In all
Natural science	63	0	37	100 (8)
Technical science	100	0	0	100 (7)
Health science	73	13	14	100 (22)
Agricultural science	100	0	0	100 (3)
Social science	0	0	100	100 (6)
Arts	20	0	80	100 (10)
Research in general	100	0	0	100 (1)
Total percentage	60	5	35	100 (57)

Most news items on research are presented with a positive expectation to the consequences of scientific discoveries, particularly coverage of natural science, technical science, agricultural science and health science. In the news items within these four research areas, almost all expectations are positive. In news items on social science and arts, the expectations are most often neutral. The category ‘Research in general’ only contains one news item, and will not be analyzed further in this section.

Table 29 also shows that health science is the research area most often covered in the TV-news. 22 out of 57 news items, or 39 percent, in the examined

period concerned health science, which corresponds with the results presented earlier in this report. The focus on health science appears to be massive in Danish TV-news, among Danes as well as among other Europeans.

Somewhat surprisingly, arts come in second in Danish TV-news, followed by natural science, technical science and social science. Agricultural science and news items about general research themes are rare in Danish TV-news.

Compared to the newspapers, TV-news obviously focus more on health science. It is also clear that the newspapers' focus on social science cannot be found in the TV-news. Finally, it is clearly demonstrated that newspapers are somewhat more comprehensive in their coverage of research than the TV-news.

TV mainly covers Danish, publicly funded research

The analysis of the newspaper coverage of research showed that there is a tendency to cover Danish, publicly funded research, although foreign and privately funded Danish research is much more comprehensive.

This bias can also be found in the TV-news. 75 pct. of the 57 news items concern Danish research, 73 pct. publicly funded research, while only 11 percent concern privately funded research. In the rest of the news items, it was not possible to determine the source of funding.

Following these results, it is very clear that TV-news focus on research from institutions of higher education and research from hospitals. These results support the findings in the analysis of newspaper coverage of research.

New project is the starting point for research coverage

The analysis of the newspapers showed that the most frequent starting point of articles with research as principal component was a new project or a book/report.

Table 30: Starting point for TV news items on research, according to research area. Percent

	New project	Journalist's initiative	Other	In all
Natural science	88	0	12	100 (8)
Technical science	43	0	57	100 (7)
Health science	50	32	18	100 (22)
Agricultural science	33	0	67	100 (3)
Social science	67	17	16	100 (6)
Arts	70	20	10	100 (10)
Research in general	0	0	100	100 (1)
Total percentage	58	18	24	100

The result is very similar to that of the newspaper analysis. In a majority of TV news items, 58 percent, a new project is the starting point, most prominently in news items on natural science and arts. Only in news items on health science, social science and arts does a journalist take the initiative. The category 'other' is prominent within technical science and agricultural science. These starting points cover everything from news items on the Nobel Prize to a political initiative on a new research project.

High-ranking sources are used in news about research

Not surprisingly, the study finds that experts are frequently used as sources in news items on research, and that professors and senior medical doctors are the preferred experts. These results are similar to those found in the study of newspaper coverage of research. The Danish media thus seem to prefer high-ranking and well-established researchers.

Many different journalists contribute to news coverage of research. One journalist rarely contributed more than one news item on research in the two month period, so the two Danish TV-stations do not operate with dedicated science journalists.

Combined with their tendency to use high-ranking scientists as sources, this could produce a bias in the coverage of research. It will be very difficult for journalists to discern the scientists' statements, which really puts the scientific community in the driver's seat as far coverage of research. Critical distance and journalistic scrutiny could have a hard time in this set-up.

Different coverage of different research areas

The second part of the study of the way Danish TV-news cover research examined in more detail how the specific research areas were covered in the news.

The overall conclusion was that there was a big difference between the research areas. As showed earlier, natural science, technical science, health science and agricultural science are covered in a more positive way than social science and arts. This is crucial to the manner in which the news items in these two groups of research areas are presented.

As an example in the first group of very positive news items, consider this introduction:

> **News host:** Danish researchers have made a unique discovery; a discovery that will revolutionize computer technology well into the next millennium.

We notice the very positive language and the total lack of critical distance to the news reported. This style is found in many news items on the four research areas: typically, a very positive introduction, followed by pictures of researchers working in a laboratory, then an interview with a researcher explaining how important the new discovery is. The news items often end with yet another positive speech from the news host.

Not all news items concerning the four research areas are uniformly positive, but the coverage is generally very uncritical.

News items concerning social science and arts are much less positive than news items concerning the above-mentioned four research areas. They are very seldom critical or negative, but only a few are directly positive.

Frame, stories and discourse

The overall picture of research coverage in Danish TV-news can be seen within one coherent frame. This frame is nourished by a conception that research is a very important activity in the modern western society. This conception seems to underlie most news items on research. This underlying notion of importance is mainly constituted through the stories and through the language in the news.

The study shows that many news stories about research are told through what can be called an intentional story of cause, leaving no room for insecurity and risk: Everything is going according to plan; the scientists are making important new discoveries to the benefit of society. The underlying story is often: A new - formerly hidden truth - has been revealed. Positive language supports these stories. Words like *sensation, miracle* and *unique* are often found in the news items.

Not all news items on research are positive. As shown in the last section, different research areas receive different coverage. When this is said, the general picture - the general frame - of Danish TV-news coverage of research is one of positive coverage, ripe with positive stories and positive language

Especially people with a relatively short education have a positive view of health science. According to many communication researchers, these people are affected by the way the media frame news on health science. People with a longer education are to a higher extent capable of seeing through the positive news frame and distil the critical potential in the news items.

All in all, it seems clear that the way the Danish media frame their news on research affects people's attitude towards research.

Conclusion

This report discusses several aspects of Danish research and its relation to society.

First, it was established that Danes have a great interest in research. 57 percent of the Danish population expresses a relatively high interest in research. The interest in research activity is especially gathered around health science, as expressed by 66 percent of the respondents.

The examination of the Danes' knowledge of research proved that they are able, to a great extent, to mention correct fields of research within the six main areas. Generally, women know more about health science than men, while more men than women are able to mention correct fields of research within natural science and especially within technical science. In all cases, higher education leads to greater knowledge about the six research areas.

The examination of the Danes' expectations to research shows that they, in general, feel very confident about research. Concretely, women are more sceptical than the men about whether research leads to certain knowledge or new uncertainty. The analysis of trust in Danish researchers draws a picture of great trust and confidence. In the same way, Danes feel that researchers are capable of deciding their research area. The conclusion must be that there is a broad feeling of confidence and trust in Danish researchers and their work.

To the question of who should decide what the individual researchers should work with, the majority answered that the researcher should make the decision in co-operation with others. However, 26 percent answered that it is generally up to the individual researcher. Male respondents and older respondents tend to believe that the researchers should decide for themselves. As far as who should be part of deciding research areas, 72 percent believe that elected councils/organs should have a say. Likewise, many people believe that other researchers within the same area and the management of the research institution should also be part of the decision. Only 13 percent believe that the national trade union should participate, and 56 percent answered that the population as a whole should also be part of the decision.

The report then shows that 76 percent of the Danes believe that research can help solve some of their everyday problems.

Next, the report examines how the respondents feel about funding for Danish research, whether they believe funding is adequate or inadequate.

Nearly half of the respondents, 46 percent, feel that Danish research is underfunded; 21 percent feel that the funding is adequate; five percent think that funding is too high; and 28 percent answered 'Don't know'.

68 percent of those who believe that Danish research is underfunded have health science in mind, 29 percent natural science, while the remaining research areas were mentioned by 13-23 percent. Especially women mention health science, and although more men than women mention technical science, health science still has the highest priority, also among men.

As a conclusion of the more general questions about the Danes' knowledge of and attitude to research, people were asked what task they believe is the most important for scientific research. Once again, the answers prove that health science and health research are dominating in the Danes' consciousness.

The next sections in the report examined where Danes acquire their knowledge about research.

The conclusion is very clear: Most Danes, 95 percent, get their knowledge about research from television. Newspapers are also frequent sources, followed by the radio, which is still the source from which more than half of the Danes gain their knowledge about research. Furthermore, many people talk to family, friends and colleagues about research.

Research is something the Danes often hear about: 27 percent had heard about research within the last week before the interview, and 55 percent within the last month.

According to communication theory, it is to be expected that people who use different sources to acquire knowledge about research possess different knowledge, based on an expectation that different sources cover different aspects of a given area. Provided that all media cover the same discussion, we will establish differences only as results of social differences, that is, educational differences or differences in interests. Differences have been established when it comes to knowledge, in this case measured from a joint index on knowledge about research. Increased use of the various sources to

acquire information about scientific research increases the level of knowledge. The only instance where the level of knowledge does not rise is increased use of weekly magazines, perhaps due to the weekly magazines' focus on health science research.

Furthermore, this study shows a large difference in the level of knowledge, according to whether one is actively, socially or passively informed about research. The greatest knowledge is found among the actively informed, the lowest level among the passively informed. The socially informed were, in this connection, placed in between the two other groups.

The analysis of Europeans and their attitude towards and knowledge of scientific research supported the Danish results.

In general, Europeans are also interested in research, and they are most interested in health science. 45 percent of the respondents answered that they are very interested new medical discoveries. The interest in other scientific areas and in politics and sports are much lower.

The interest in health science is associated with great respect for medical doctors. This profession is much more respected by Europeans than judges, lawyers and journalists.

Europeans do not feel they know a lot about research. Especially the Portuguese feel they know very little about research.

The attitude towards research is very positive. Only 13 percent of the respondents disagree with the statement that science makes life better. Along the same line, only 11 percent of the respondents do not support government funding for research.

As in the Danish survey, the overall conclusion is great support for health science, which Europeans see as the most important research area.

Turning to the question of sources for scientific information, TV is clearly the most commonly used source, followed by newspapers and scientific magazines.

After this the report described how research is discussed in the five large Danish morning papers and in Danish TV-news.

The study shows that especially social science research is dominating in the newspapers, based on the total number of articles. Next, arts and health science research are also often represented in newspaper articles. If we only look at articles with research as principal content, it appears that the research area which is most often discussed in the newspapers is arts, followed by social science and health science.

In articles with research as secondary content, journalists usually take the initiative to write about research. In articles with research as principal content, a book or a scientific report is often the background for writing about research in the newspapers. Likewise, they often refer to a book, a report or a concrete project article as well as to other articles.

Researchers who are quoted in articles are often professors, senior lecturers or researchers within a specific area. In 12 percent of the cases, professors are quoted. The gender distribution among researchers who make statements in the newspapers is not equal: In 45 percent of the articles, the statements are made by men, in 12 percent by women. Female researchers comment more frequently on health science and agricultural science than male researchers.

54 percent of the articles in which research appears are news articles, when it comes to articles with research as principal content. Paragraphs and book reviews are also typical types of articles which bring research. For arts, book reviews make up 32 percent of the articles on research in that area compared to 0-8 percent in the other research areas.

Furthermore, the study shows that a wide range of journalists write about research in the newspapers. Only a few of the journalists had written more than 10 articles on research in the period examined. Moreover, it appears that more male than female journalists write about research.

It is also clear that newspapers mainly refer to Danish research: 66 percent of the articles with research as principal content are about Danish research, 29 percent about foreign research. Especially articles about natural science deal with foreign research, while agricultural science is the most ‘Danish’ research area. Research from EU, UN and OECD is rarely mentioned in Danish newspapers.

Public research receives a lot of attention in the newspapers. 66 percent of the research mentioned in the newspapers is public. The institutions of higher education carry out 33 percent of the research mentioned in newspaper articles with research as principal content, while 13 percent of the articles deal with research from the hospitals and the health service. Private business is only registered as research sector in eight percent of the articles.

Over all, most coverage is positive. 29 percent of the articles with research as principal content have a positive attitude towards research, seven percent of the articles have a negative attitude and in half of the articles, the tone is noted as neutral. Technical science is often mentioned in a positive tone, while articles on research in general are negative.

The study of Danish TV-news showed that health science was very dominating on TV. 39 percent of the news on science concerned health science. Compared to the newspapers, the Danish TV-news thus focuses more on health science.

The study furthermore showed that Danish TV-news presents research in a very positive way, especially news on natural science, technical science, health science and agricultural science. Coverage of social science and arts is less positive than the coverage of these other research areas. Despite this difference, TV-news coverage of research is generally positive and uncritical.

As the newspapers, Danish TV-news mainly covers Danish, publicly funded research from the institutions of higher education and research. New projects or new books are often the starting point for TV-news coverage of research.

As was true with the newspapers, high-ranking sources are often used in the TV-news. Professors and senior medical doctors are most frequently interviewed in the news items.