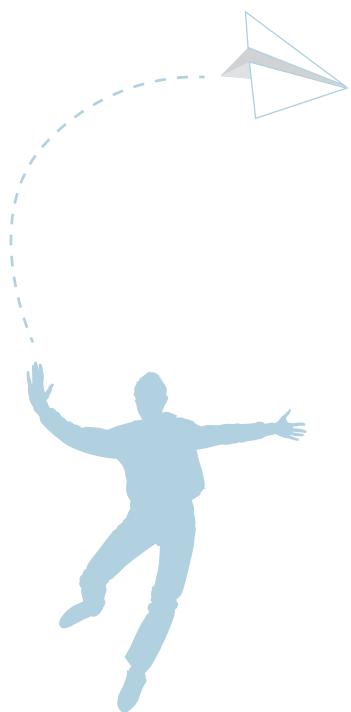


Summary of the Finnish Science Barometer

2019

A STUDY OF THE FINNS' ATTITUDES TOWARDS SCIENCE AND THEIR OPINIONS ON SCIENTIFIC
AND TECHNOLOGICAL PROGRESS





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People trust in science

Since the publication of the last Finnish Science Barometer (2016), there has been an increasing tendency to challenge, deny and down-right downplay science – a rising trend that has been noted since the turn of the decade. Political powers in many countries have also challenged scientific evidence. For example, when it comes to the global fight against climate change, our frontline stands far from unbroken.

Considering the current opinion climate, it is even more interesting to use an established survey to find out how the general public regards scientific information. During its long history, the Finnish Science Barometer has been quite effective in gauging trends in the public's trust in science. The Science Barometer's datasets have been surrendered to the Finnish Social Science Data Archive (FSD), which operates out of the University of Tampere. According to the FSD's user statistics, there has been significant external interest in the series' earlier datasets.

And once again, the Finnish Science Barometer does not provide any evidence of increasing public opposition to science. Seven out of ten respondents said that they follow science, research and technology-related topics with interest. This scientific interest also seems to be firmly directed at nature, society and the economy. The Science Barometer also backs up an observation made in political research: there is growing interest in political issues.

Finland's success is based on research and education that has a firm scientific foundation. Understanding and appreciating this fact has been the backbone of the country's growing wealth and welfare for decades. Finns believe in science and education just as passionately as before. The latest Finnish Science Barometer proves this beyond doubt. And perhaps this is the most important message from the public to the political elite – invest in research and education, because they are the only means to ensure Finland's continued success in the future.

Markku Löytönen and Vesa Varpula

Chair and Secretary of the Finnish Society for Scientific Information

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1. INTRODUCTION

How do Finns perceive scientific activities? Is the scientific community perceived as competent and efficient? Can researchers be trusted? Is research worth investing in? Do science and research have any priority among people's interests, value systems and attitudes?

The Finnish Science Barometer 2019 seeks answers to these questions. The report analyses Finnish citizens' relationship with and attitude towards science on the basis of nationwide survey data. It examines scientific information from a variety of perspectives relating to production, necessity and standards. The attributes surveyed include the benefits and risks of scientific advancement, scientific morality, and global perspectives. Although the report primarily takes a national perspective, it does so within an international and global framework.

In addition to establishing current public opinion, the survey also looks for changes in people's attitudes. The latest results are comparable with six earlier datasets, both content-wise and in terms of methodology (Finnish Science Barometers 2001, 2004, 2007, 2010, 2013 and 2016).

Due to the number of surveys that have been conducted, the barometer has become a systematic approach to studying public opinion and changes in public perception. With the latest survey, the series already covers a period of eighteen years.

The social atmosphere was somewhat different when the previous survey was conducted (2016). At that time, the media was full of dramatic interpretations according to which there was a significantly increasing tendency to challenge, deny and downplay scientific information in Finland. After cuts in education and speeches made by academics, the general view was that science had also been unfairly treated by political decision-makers and all this was starting to undermine its status.

Although the aforementioned tendencies are still around – and have always been around; this is not a new phenomenon – the social atmosphere is much calmer and therefore more 'normal'. However, in retrospect, you could ask how much this concerned debate reflected the actual situation three years ago. The Finnish Science Barometer 2016 did not provide any empirical evidence of "increased public opposition to science", even though it was thoroughly sought.

Comparably little research has been done into public opinion on the social significance of science. Both national and international reference material – and particularly material that monitors the topic extensively and systematically – is still very scarce.

The first Finnish Science Barometer (2001) was conducted with a pioneering spirit.

Both the barometer and its question set were begun from a clean slate, without relying on approaches that had been taken elsewhere. The idea was to analyse public opinion while taking into account national conditions, characteristics, institutions and themes of public debate. However, the Finnish Science Barometer is not beyond compare – it does have older and younger relatives.

The questions used in the latest survey remained almost unchanged. The previous set of questions was considered to be sufficiently relevant and comprehensive, and so no major changes were required. Feedback on the reports had not really necessitated revisions to the questions either. It is, of course, also important to maintain conformity in order to measure changes in attitudes. However, the question set was revised with regard to a few topical issues, such as attitudes towards vaccinations and perspectives on reliable sources of information about health and nutrition. Artificial intelligence was also a term that was introduced for the first time. The questionnaire appended to the report provides more detailed information about the survey's question set.

The approach adopted in the report is strictly empirical and limited to the survey data. It does not offer any definitions of what science is or is not. These questions will be left for other presentations, as space is limited and they are not relevant to the scope of this report. The survey employs concepts as they are used in public debate and the media – which are unavoidably more or less loose – that is, in 'everyday language'. The aim has been to describe the statistical data in a cautious and diverse manner in order to interpret dependencies between factors.

1.2 Research data and reporting method

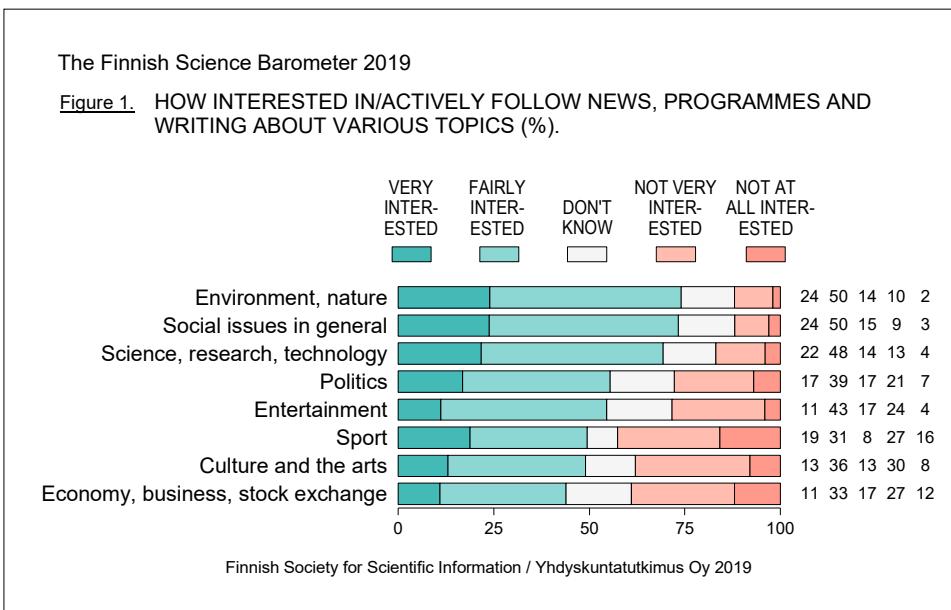
The Finnish Science Barometer 2019 includes the opinions of a total of 2,209 people. Unlike previously, it consists of two data subsets. The basic dataset was collected using a written postal survey, as before ($N=1,063$). The target population was 18–70-year-olds in Finland (excluding the Åland Islands). The target persons were picked randomly from the population register with the Finnish Population Centre's permission. Data was collected in the period 3 June–26 August 2019. As previously, this survey was conducted by Yhdyskuntatutkimus Oy.

The second dataset consists of an online survey carried out by Kantar TNS Oy's Gallup Kanava panel. Its data matrix contains 1,146 respondents. This data was collected in the period 5 April–11 April 2019. As respondents to the panel's survey had a wider age range (there were a few respondents aged under 18 and over 70), analysis of the combined data has been limited to respondents within the barometer's age limits. For most of the analyses performed in the report, this respondent group consists of 2,125 people. Kantar's dataset accounts for almost exactly half of this (1,062 people).

The technical construction of the combined dataset ensures that Kantar's weighting affects only that subset. As per standard practice, the postal survey was not weighted in any way. As the Kantar dataset was collected before the final questions for 2019 had been decided upon, its data was gathered using the 2016 question set. This means that responses to several questions are only available from the postal survey. These are the new questions in the 'variable questions section' at the end of the form plus six statement-based indicators. Likewise, the Kantar dataset provides responses that update the time series for several questions that were removed from the 2019 survey to make way for new indicators (nine statements). The total number of reportable questions is therefore slightly higher than usual. The extra background variables provided by the Kantar dataset also enable more diverse analyses of the data (such as political ideology, which has not been asked in the barometer series).

Pentti Kiljunen headed up the research and wrote the report.

This English-language summary contains the most important observations made in Kiljunen's original report. A PDF of the original Finnish report can be downloaded at www.tieteentiedotus.fi.



2. FINNISH INTEREST IN SCIENCE

Finnish people's relationship with science was gauged by asking questions about their interest in news, programmes and texts about scientific matters (Figure 1). The respondents were asked to say how interested they were in, or how actively they followed, news, programmes and writing about a variety of topics in the media.

Two topics clearly held the joint number-one spot in terms of interest. Three out of four respondents said they followed matters concerning nature and the environment (74% said they were very or fairly interested; 2016: 81%). Social issues also generated the same level of interest (74%; 2016: 74%). Social issues themselves are clearly of more interest than their management: politics did not interest people nearly as much (56%; 2016: 51%). The economy and its associated themes are of even less interest than politics (44%; 2016: 39%). Culture and the arts are also highly polarising topics (49%; 2016: 48%).

For science, the results are flattering. More than two out of three respondents (70%; 2016: 68%) said that they follow science, research and technology-related issues with interest. The figure is up two per cent on the previous Science Barometer.

A comparison of this year's results with the findings from three years ago shows that, on the whole, not much has changed. The results across the whole time period are also relatively consistent.

This increased interest in science contradicts the concerns and perceptions voiced in the media, according to which the public feels alienated from science. It is nevertheless important to keep in mind that not all interest is necessarily positive. People who challenge or deny science may well follow science more actively just to find errors and grievances.

Links can be discerned between the tendency to follow one subject and the tendency to follow another by examining correlation factors. Interest in science has a positive correlation with an interest in following environmental ($r=.40$), social (.39) and economic (.39) issues in particular. Interest in politics and culture also increases noticeably with interest in science.

2.1 Population-specific differences

Men are more interested in science than women. On average, the highest interest scores were given by 26–35-year-olds.

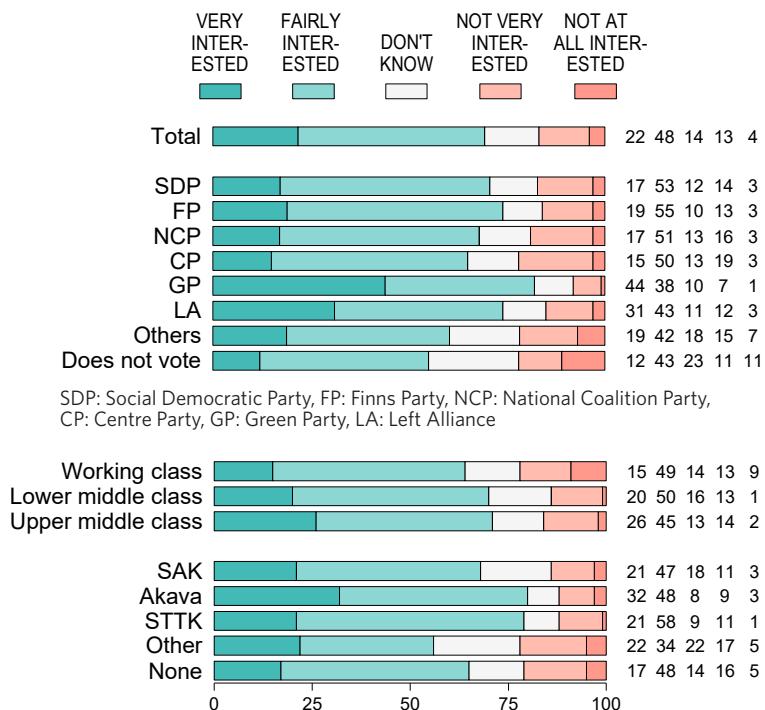
To some extent, this correlation with age can also be seen as a curve, with the highest rates of interest among the middle age groups. Although there is also extensive interest in the youngest age group (18–25-year-olds), this group has never been the most interested in any of the surveys. On average, interest scores were highest among the second-youngest group (26–35-year-olds).

There is also a clear and direct correlation with the level of respondents' education, both in terms of basic and professional education. The highest level of interest was found among the academically educated: more than four out of five such respondents (86%) said they were interested in science. Respondents with the greatest interest in science included those who had studied both technical subjects and the humanities.

If the scope is extended to factors indicating political-social orientation, political ideology (voting intention in the parliamentary elections) also differentiates interest in science to some extent (Figure 2¹). Green Party supporters show the highest interest, and Left Alliance supporters also stand out noticeably. No group identifies as being alienated from science – not even Finns Party supporters, whom the media usually paint in these colours. (However, this group clearly does live up to its media image in some areas, with little interest in culture and the arts.)

The Finnish Science Barometer 2019

Figure 2. INTEREST IN VARIOUS TOPICS: SCIENCE, RESEARCH, TECHNOLOGY (%)



2.2 Comparison of scientific fields

Public interest in science was also measured from a qualitative perspective. Respondents were asked how interested they are in, or how closely they follow, a variety of topics relating to science and research. In addition to named fields (six exemplary areas of research), respondents were asked to evaluate more general indicators of their interest in science.

The results show three fields that clearly stand out from the rest. Medicine was of most interest. Two out of three respondents (68%; 2016: 75%) said that they follow progress in the development of new drugs and treatments. This is quite natural, as medicine most closely affects people's own lives. Breakthroughs in medical science affect everyone, as some are literally a matter of life and death (Figure 3).

The number of respondents who follow findings about the state of the environment came in a close second (66%; 2016: 68%). This result also indicates underlying general concerns, as preserving the environment is the lifeline of our civilisation in the long term.

The Finnish Science Barometer 2019

Figure 3. HOW INTERESTED IN/ACTIVELY FOLLOW VARIOUS TOPICS RELATING TO SCIENCE AND RESEARCH (%)



¹ For the first time in the Finnish Science Barometer, this information is based on a dataset collected by Kantar TNS. Figures based solely on the Kantar dataset are marked with a "K" in the lower right corner. Likewise, figures based solely on the postal survey are marked with a "P". Results that have been calculated from the combined dataset are not marked (the majority of the report's results). The lack of information about political orientation as a background variable is not an oversight. It was an intentional decision based on the prevailing policy for granting access to information contained in the population register back when the project was launched in 2000.

General interest in scientific development, new research findings and inventions is ahead of interest in medicine and the environment. A large majority of Finns said they had this kind of general interest in new information (74%; 2016: 73%). In the middle group, notable interest was shown in historical and cultural research (54%), computers, internet and IT development (53%) and genetic research and biotechnology (50%). The least interesting field (out of the given scientific fields) was space research (45%).

However, the least popular topic of all was science policy (research and education funding; science and education policy) at 35%. Although this is a critical issue from the perspective of the scientific community and has been particularly topical in recent years, it is understandably a very abstract concept for the general public to evaluate. The international success of Finnish science has begun to attract slightly more attention: two out of five respondents (42%) were interested in the global race for excellence.

3. SCIENCE IN THE MEDIA

Scientific information has many other coordinates in addition to its volume and subject matter: for example, its source, type, understandability, level of detail, and credibility. The survey is limited in its ability to analyse these perspectives. The questions were restricted to sources of scientific information. Respondents were asked to assess the importance of various sources in providing information about science and research.

Mass media clearly proved dominant and – as is generally the case when the general public's information sources are tracked – digital media beat print media. Television and radio (75%; 2016: 81%) are considered somewhat more important as sources of scientific information than newspapers (63%; 2016: 71%). (See Figure 4.)

There is a clear and systematic upward trend in the importance of the internet. The internet, data networks and social media were almost on par with traditional mass media (74%; 2016: 70%). Strictly speaking, the internet can be said to have come out on top, as it had the highest ranking by a whisker when measured using the scale average.

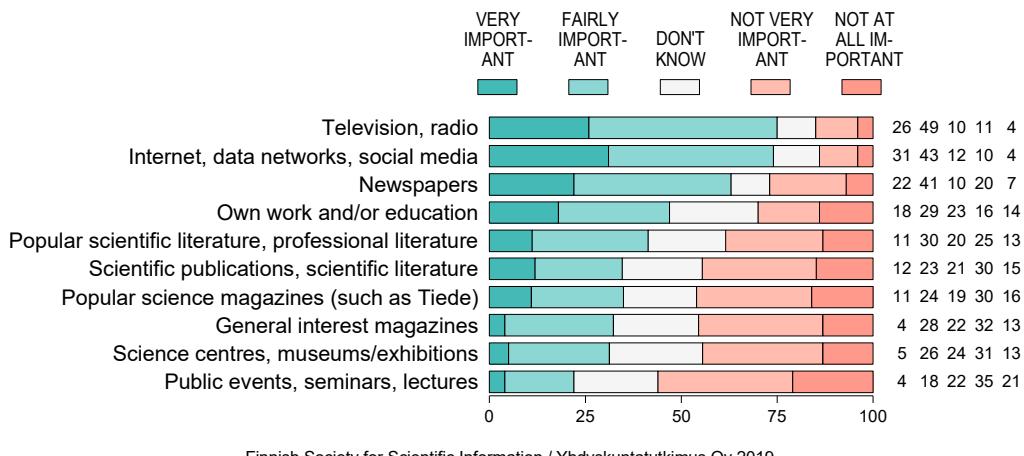
Almost one out of two respondents (47%) named their own work or education as a source of scientific information, while two out of five (41%) cited popular science and professional literature as a source. Popular science magazines are on par with scientific publications and literature (35% for both). Slightly fewer respondents get information from general interest magazines (32%) or science centres and science museums/exhibitions (31%). According to the responses, the least important sources of scientific information are public events, seminars and lectures (22%).

Gender has only a minor impact on sources of information. Science centres, seminars, lectures and other public events were slightly more popular sources of information for women. Men based their knowledge relatively more on popular science magazines and scientific publications.

The role of data networks correlates with age. Young people rely heavily on the internet (correlation between age and importance of the internet = .25). On average, younger age groups also placed higher importance on their own work or education (which could largely be explained by the way age structure is tied to education structure). The importance of scientific publications increases as age decreases.

The Finnish Science Barometer 2019

Figure 4. IMPORTANCE OF DIFFERENT SOURCES IN PROVIDING INFORMATION ABOUT SCIENCE AND RESEARCH (%).



Finnish Society for Scientific Information / Yhdyskuntatutkimus Oy 2019

4. FINNISH TRUST IN SOCIAL INSTITUTIONS

The second half of the report examines public opinion from various viewpoints. The attributes surveyed included respect for science and the scientific community, trust in scientific information and researchers, the standard of Finnish science and research, the social impact of the scientific progress and its associated benefits and risks.

Respondents were asked to assess their level of trust in various social institutions and operators. The list of twenty operators included different types of organisations and communities from various social sectors (Figure 5).

The highest level of trust was shown in the two organisations responsible for the internal and external security of Finnish society: the police (83%; 2016: 85%) and the defence forces (79%; 2016: 77%).

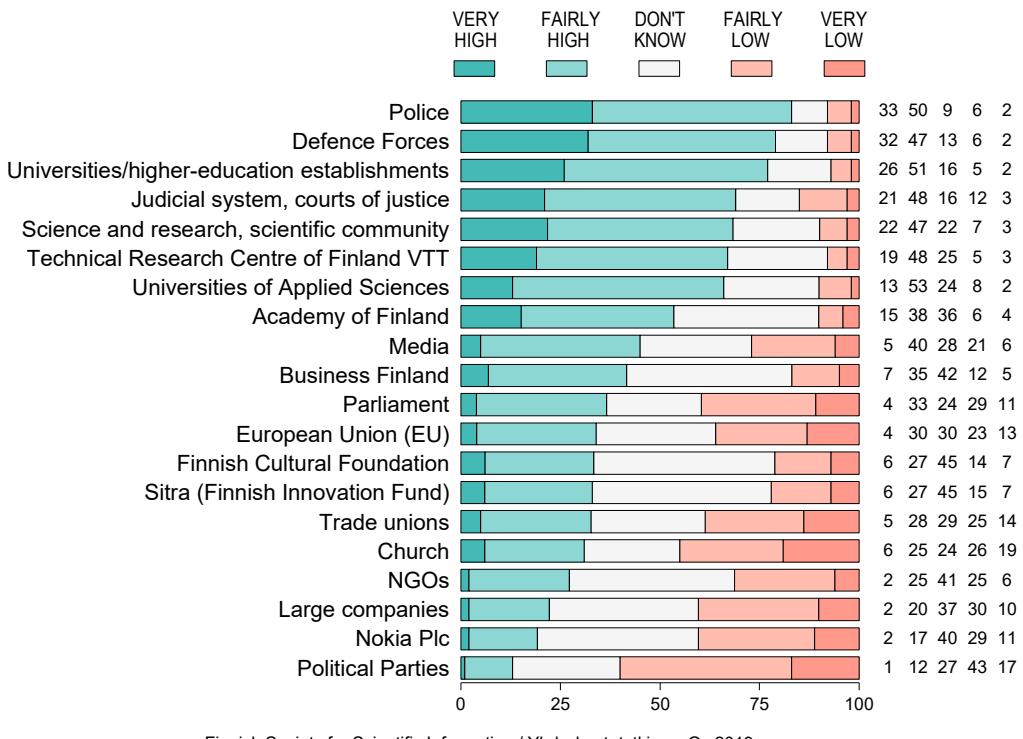
Science, both as an institution and more specifically through certain organisations, also enjoys a high degree of trust. All the attributes relating to science and research appear at the top of the trust diagram.

Amongst scientific organisations, Finnish universities and other institutions of higher education are trusted nearly as much as the defence forces. Three out of four respondents (77%; 2016: 75%) showed great trust in these higher-education institutions, while less than a tenth (7%) reported a lack of trust.

VTT Technical Research Centre of Finland is the most trusted science and research organisation on the list (67%; 2016: 59%). The scores received by the Academy of Finland (53%; 2016: 50%) and Business Finland (42%; 2016: 50%) also show considerable trust. (The questions also mentioned Business Finland's previous name, Tekes.) The general public showed an increased lack of awareness of less well-known institutions. This can be seen in respondents' views on Sitra (45% had no opinion) and the Finnish Cultural Foundation (45%).

The Finnish Science Barometer 2019

Figure 5. LEVEL OF TRUST FELT TOWARDS VARIOUS SOCIAL INSTITUTIONS (%).



Finnish Society for Scientific Information / Yhdyskuntatutkimus Oy 2019

The slightly broader and more abstract concept of "the scientific community" (science and research; scientific community in general) places notably high in terms of trust, right between universities and VTT (69%; 2016: 66%). Taking other trust indicators into account, this result can be considered as an indicator of the general public's broad-ranging respect for scientific activity. According to the results, science enjoys a good public image and a good relationship with society.

However, not all sectors of society fare as well. The results are awkward for the political system and government. Trust is negligible (13% trust, 60% don't). The Finnish Parliament also inspires more distrust (40%) than trust (37%). Many people also have suspicions concerning the EU (34% trust, 36% don't). However, these indications of political alienation are nothing new: the responses correspond to an almost standardised outcome of many studies.

For the remaining operators, opinions about the media, trade unions and the Church are very polarised. The scale tips to the positive side for the first one, but to the negative side for the latter two. The situation is quite dire for large companies, although NGOs do not fare much better. Nokia is trusted even less than large companies in general.

On the whole, a comparison with the results of the previous survey suggests an increase – rather than a decrease – in the level of trust felt towards society in general. The most recent survey not only indicates that trust in science has remained strong, but also suggests that it may have even increased slightly.

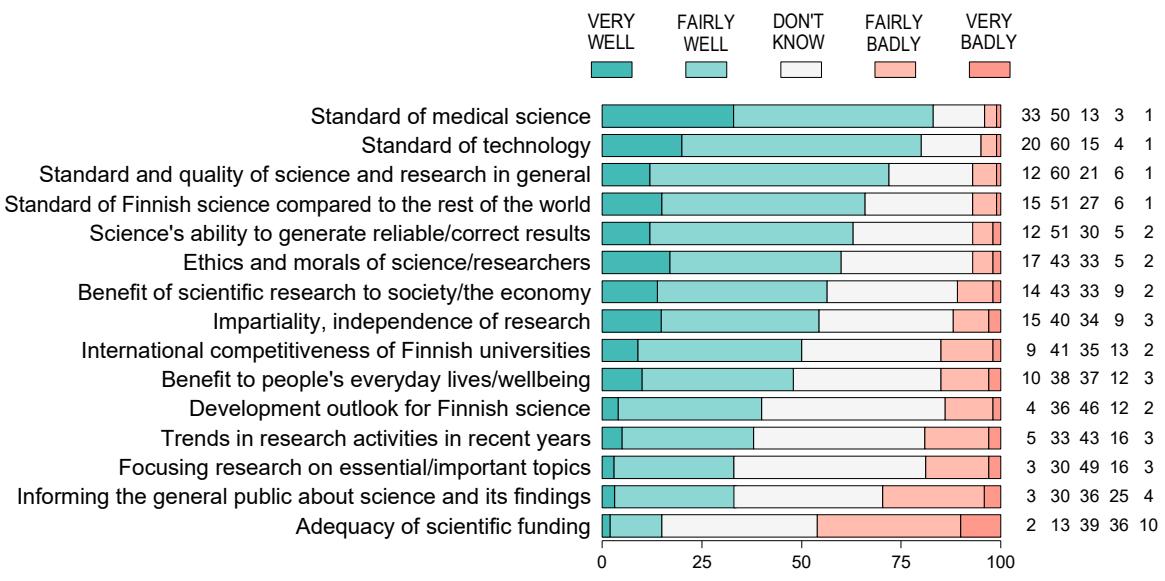
4.1 The status of science – how well or badly are things going?

The survey also included a series of questions on the current state of Finnish science. They provide a slightly more concrete and more dissected view of the status of science in public perception. Respondents were asked to assess how well or badly things were going for science and research in Finland at the moment.

The overall results were positive (Figure 6). Approval was given for the key attributes of the quality and standard of science and research. The highest scores were given to the standard of medicine (83% rated the standard of medicine to be very good or fairly good; 2016: 89%) and the standard of technology (80%; 2016: 81%).

The Finnish Science Barometer 2019

Figure 6. HOW WELL OR BADLY ARE THINGS GOING FOR SCIENCE AND RESEARCH IN FINLAND AT THE MOMENT (%).



Finnish Society for Scientific Information / Yhdyskuntatutkimus Oy 2019

In addition to the aforementioned scientific fields, the public also hold the entire scientific community in high regard. The general quality and standard of science and research in Finland is also deemed good. More than seven out of ten respondents (72%; 2016: 73%) gave it a good overall score. The Finnish public are somewhat less convinced when evaluating the situation beyond the country's national borders, although the score has risen on the previous survey's result (66%; 2016: 58%). A slight rise was also seen with regard to the international competitiveness of Finnish universities (50%; 2016: 44%).

Due to the nature of the issues involved, science cannot be directly blamed for the categories with the lowest scores. Respondents displayed the most critical attitudes to the adequacy of research funding and providing the public with sufficient information about science and scientific findings. Criticism over the scarcity of funding naturally indicates a certain level of support for science and a respect for research.

These assessments are ultimately a question of trust, including trust in the information that the media and scientific experts give to the public. This naturally applies to the formation of the majority of public opinion in other areas. In this sense, many of the 'don't know' responses concerning the status of science are quite rational and to be respected for their honesty – and even show a certain level of awareness.

4.2 Science's ability to solve problems

The survey also gauged people's expectations of the impact of science. Respondents were asked about their perception of science's ability to solve problems or provide assistance in problem-solving in general. The issues to be resolved were universal in nature, not everyday practical problems. They were viewed from a global perspective without focusing on Finnish science.

The idea was to get a view of the concrete benefits of science and the things that people believe science can have an impact on. The questions were also designed to gauge respondents' world view and act as a barometer for the public's 'level of faith' in science.

Respondents' expectations were in general optimistic yet not overly hopeful. Pessimism is also widespread in the results, regardless of people's trust in science's ability to assist in many important issues (Figure 7).

Respondents were the most unanimous on science's ability to help us beat diseases (cancer and AIDS were the examples given). More than four out of five respondents (85%; 2016: 90%) thought we had a very or fairly good chance, while very few thought very or fairly bad (4%). This result is understandable, as people also see the standard of medical research as high, and evidence of success is everywhere.

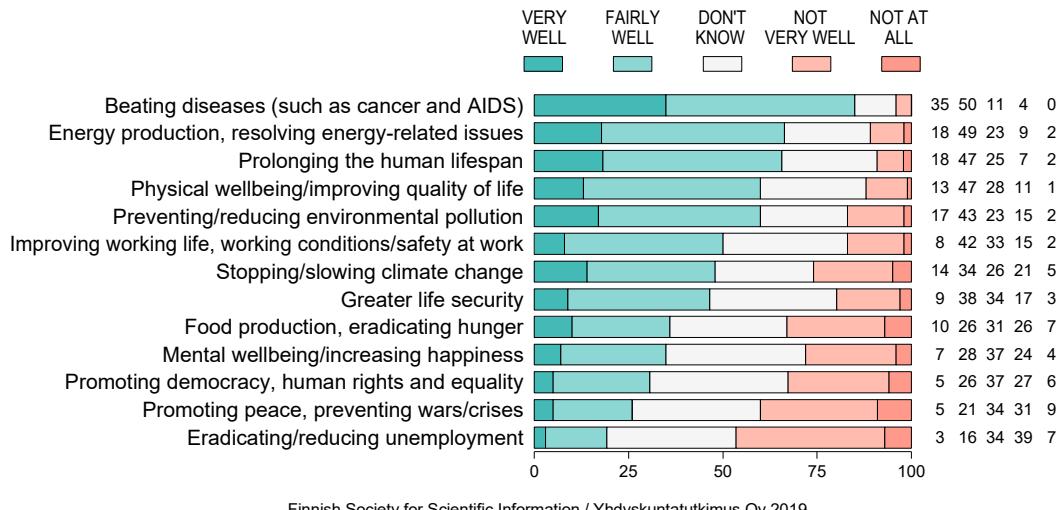
One of the highest scores is also related to health, that is, prolonging human life (65% vs 9%). The question of whether such a goal is at all necessary for science, or to what extent this goal is meaningful, is left for the reader to decide.

Energy-related issues also received optimistic responses. Almost two thirds of all respondents (67%) think that science will be of considerable assistance in solving energy production-related problems. Only a few (11%) were pessimistic.

A comparison with the results of the previous survey shows that respondents were slightly more positive than before almost all across the board. There has been little change in how people perceive the power of science and the opportunities it affords.

The Finnish Science Barometer 2019

Figure 7. HOW WELL CAN SCIENCE SOLVE PROBLEMS/PROVIDE SIGNIFICANT ASSISTANCE TO THE HUMAN RACE IN VARIOUS AREAS (%).



Finnish Society for Scientific Information / Yhdyskuntatutkimus Oy 2019

There has been an upward trend across the entire time series, which suggests that people's 'faith in science' is getting stronger. This interpretation is also supported by the fact that none of the fields surveyed are rated more pessimistically today than they were in 2001.

People have perceived science and research to be just as important throughout the entire research period. The only change is that national opportunities for success are now seen as more limited.

Variations in the expectations of men and women are mainly based on their weighting of different areas. Men have more faith in science's ability to solve energy-related problems and improve material wellbeing, while women have more optimistic views about its ability to rid us of diseases. Women were also less sceptical than men about science's ability to promote democracy and human rights and to prevent wars. Optimism concerning the opportunities afforded by science also increases with education.

5. OTHER VIEWS ON SCIENCE – CONCRETE EXAMPLES AND SUPPLEMENTARY PERSPECTIVES

5.1 Appreciation for science and its impact on wellbeing

As shown above, the general public has faith in science and holds the standard of Finnish research in high regard. These views are also supported by the responses to the statements included in the survey.

Three out of four respondents (74%) agree with the statement that 'Finland's science and research are characterised by efficiency and a high level of professional expertise'. A very small proportion of the population felt differently (6%). This split in opinion has not changed considerably from the previous survey, or the two surveys prior to that. The cautious growth that occurred in the early stages of monitoring has since stopped, and scores have stabilised at the current level.

The result is compatible with earlier observations about stabilisation (such as public understanding of the status of science). Views on the importance of science for general wellbeing are more divided. Slightly more than one out of two respondents (52%) agreed that 'wellbeing in Finland crucially depends on the standard of our scientific and technological research'. Just less than a fifth (18%) disagreed. This result shows more approval than in the previous survey: the proportion of respondents who agreed has risen by 6 percentage points. Approval is also the highest it has ever been. The midway slump (2010) has now finally disappeared.

Attitudes had, in practice, previously (2001–2007) remained unchanged. When interpreting the results, the exacting tone of the statement – including the direct connection it makes to fateful consequences – should be noted.

There is also an indirect link between the appreciation that people have for scientific information and concerns that it is not being used efficiently enough. Two out of three respondents (67%) felt that 'political decision-making takes far too little advantage of information based on scientific research'.

Viewed in light of debate in recent years, these results could be interpreted as indicating that the public in fact consider the number of professors who act as political advisors is too low rather than too high. On the other hand, the problem faced by politicians could be that it is difficult to select the right expert from those with different orientations. For example, choosing an expert in economic issues may end up being a value judgment.

5.2 Science and worldview

A third of respondents (32%) felt that 'a worldview based on science does not conflict with religion'. More disagreed: about two out of five (42%). These views are likely to be primarily influenced by the clash between the theory of evolution and the Genesis creation narrative, and maybe also in part by other friction at the intersection of biosciences and theology.

The claim that 'humans have evolved over millions of years from other, earlier species of animal' meets widespread, but not unanimous, approval. Seven out of ten respondents (71%) agreed, while a tenth (10%) did not. In practice, this split does not differ from the previous survey. However, the last five surveys show a slight growth in the establishment of evolutionary theory. The figures in the first of these surveys (2007) largely corresponded to the results of a survey conducted by the

magazine "Science". The number of respondents who considered evolution to be true was equal in both surveys (66%). However, the barometer had slightly fewer respondents who challenged the theory compared to the comparison data in question.

The argument that 'the progress of climate change is a real and serious threat that requires effective action from political decision-makers' was supported by the majority (73%; 2016: 84%). Few were of a different opinion (14%). In the light of current socio-political rhetoric – the crisis-like nature of the climate problem has increasingly been addressed by almost all parties in society – stronger public opinion could have been expected. On the other hand, a political party that sparked off debate about 'climate hysteria' did extremely well in the parliamentary elections that were held around the time the survey was conducted. Socio-psychological explanatory models, such as a tendency to avoid unpleasant truths, are worthy of note here.

5.3 The ethics and morals of science

The ethical and moral aspects of science can be studied from various viewpoints, such as on the basis of research topics or objectives, the research methods employed, or the personal actions of researchers.

In the first sense, an example of unethical research could be a study aimed at finding the easiest way to kill off a large number of people. The second sense refers to, for example, animal testing as part of research with otherwise ethical objectives. The third perspective covers the ethics of researchers as individuals (scientific fraud, falsification and plagiarising of results, financial malpractice, and so on.).

Genetic research has been a controversial topic in public debate for a long time. Both nationally and internationally, people have strong opinions on whether researchers have the right to 'play god' or not, and also on the ramifications of such behaviour. New life has occasionally been breathed into old debates, for example, as a result of the cloning tests performed in China.

The general public tendency is clearly towards approval. More than one out of two respondents (53%) agree that 'in spite of the risks involved in gene technology (such as gene manipulation), genetic research provides great benefits to humankind'. Roughly one out of seven respondents disagreed (15%).

These opinions indicate a slight increase in approval. The reduction in disapproval (-7) was clearer than the growth in approval (+3). In the last five surveys (2007–2019), attitudes were slightly more approving than in the earlier surveys and also prior to that. (This indicator includes a national survey of values and attitudes conducted by Finnish Business and Policy Forum EVA in 1998.) This rising trend has culminated in the highest ever approval rating in the latest survey. On average, the most highly educated people also show the most approval for gene technology. Men are more approving than women. There is very little correlation with age.

Another question about genetic research generated an even more unambiguous result. Two thirds of respondents (65% agreed, 14% disagreed) believed that 'attempts to clone humans should be forbidden in all countries'. The number of respondents in favour of a ban has significantly decreased compared to the previous survey (by six percentage points). This change has caused a more noticeable downward trend throughout the entire monitoring period. A ban on cloning received visible support in those population groups that otherwise showed an understanding of genetic research. Women were more uncompromising in their views than men.

5.4 Status of alternative science

In addition to scientific information, there are a wide range of isms, schools of thought and belief systems that resemble science and compete for the public's attention (and often also for their money). These quasi-scientific, pseudoscientific, non-scientific or alternative doctrines are characterised by arguments that sound convincing and scientific, and yet are able to explain even the weirdest of phenomena.

The survey investigated the credibility of six such doctrines that are dismissed by the scientific community. The results show that some of them do get through to the public. A third of respondents (34%) agreed that 'so-called folk healers possess knowledge and skills that medicine lacks'. Slightly more people challenged this (3%).

However, belief in homoeopathy has decreased noticeably since the previous survey (-5%).

5.5 Public opinion on vaccinations and nutrition

This time, the variable questions section included two interconnected themes. The main focus was on vaccinations: a set of twelve questions was used to analyse attitudes in this area. They were supplemented by four statement-based indicators concerning the reliability of sources of information about health and nutrition. The barometer's additional questions section acts as a sort of test bench: topical questions for each survey period can be set to measure their penetration into public opinion.

5.5.1 Is it worth getting vaccinated?

Although vaccinations have been opposed with varying force and motivation for centuries, the debate shows no signs of stopping. New life has been breathed into these discussions, both nationally and internationally. The increase in measles cases has not affected only so-called 'underdeveloped countries', but also developed countries in Europe as well as the United States. In Finland, the vaccination debate was also fuelled by the Pandemrix vaccine against Swine Flu, which has been proven to have had an impact on the increased prevalence of narcolepsy. This hurriedly introduced product provided critics with a genuine case to cite.

The set of questions designed to analyse attitudes to vaccinations was selected from a number of different types of statements, some very polemic in tone and also mutually conflicting. The target persons were asked to say how well the statements matched their own personal views. The results show unusual unanimity without leaving any room for interpretation.

Vaccinations received an unequivocal verdict of 'not guilty'. The arguments were clearly ranked: those in support of vaccinations and their benefits gained the broadest agreement, while those critical of vaccinations were rejected.

In practice, the idea that 'the vaccines administered in Finland are effective and safe' received unanimous approval (95% of respondents said they completely or mostly agreed with this statement, 1% not much or not at all.) Likewise, a statement challenging the safety of vaccinations - 'vaccines are a greater risk to health than the diseases they are administered against' - received the least agreement (6% agreed, 86% disagreed).

This message did not change greatly when respondents were asked about the reliability of information provided about vaccinations. Almost nine out of ten respondents agreed with the statement 'I have confidence in the information about vaccines and vaccinations provided by authorities and experts' (89% vs 4%). 'Opposition to vaccinations is based on incorrect information and prejudice' further clarified public opinion (78% vs 6%).

However, Finns do not have a black-and-white view of the issue, as the critical statement 'there is too little discussion of the dangers and side effects of vaccinations' received almost as much agreement as disagreement (32% vs 39%).

5.5.2 Reliability of nutritional information

The dataset included four new statement-based indicators to gauge another long-debated health-related topic: nutritional information. Although low-carb enthusiasts have already disappeared from television studios, they have been replaced by newcomers who also know better than science and are here to educate nutritional scientists – particularly in internet forums. Social media has become an even more important channel for health-related information and awareness.

The statement 'by listening to their bodies, people will best be able to decide which food is most healthy for them', received more agreement (53%) than disagreement (29%). Although this in some ways conveys a certain type of stubborn 'I know best' attitude, it should probably be interpreted in an empathic way. The concept of 'listening to your own body' can be understood in many ways. This term is likely to be unfamiliar. It was launched on the internet and chargeable online courses are even available on the topic. As a consequence, this concept may be used to understand ordinary bodily reactions to unsuitable nutritional substances.

However, a breakdown by population group shows marked differences. Women are more likely to believe in the effectiveness of listening to your body than men. Although the method loses its credibility as respondents' level of education rises, even those with an academic education agreed and disagreed with the statement in roughly the same proportion (39% vs 42%). Those living in smaller towns and villages were more likely to agree with the statement than those living in cities.

Responses to the second statement – 'the most reliable experts on health matters are researchers and trained professionals in the field' – were almost unanimous. More than nine out of ten respondents (92%) agreed, with only a fraction disagreeing (2%). This statement attracted the most unanimous response of all the statements in the survey.

If the message of the results is hard to water down, it is worth bearing in mind the loose definition of the term "expert" in public debate. The concept is fluid and can be adapted to your own thinking as required. A real expert is right and thereby stands out from the rest. A whole pile of peer-reviewed studies will not necessarily stand up to some marginal idea that may have been debunked many times already.

A more detailed breakdown of respondents' opinions would end up being quite monotonous. All the population groups agreed on the statement to the same degree. Even the lowest scores were quite high (those uninterested in science 85%, residents of smaller towns and villages 87%).

Two other new health-related indicators focused on the assessment of nutritional information produced by named organisations. The statement 'The National Nutrition Council gives the best research-based nutritional recommendations in Finland' resulted in a clearly positive-weighted distribution of responses (42% vs 15%). The percentage of don't knows (43%) indicates the difficulty of this evaluation task.

This difficulty does not necessarily arise from deciding whether the statement is true, but from not knowing exactly what is being discussed. Although plate models are relatively well recognised, people may not be very familiar with the name of the organisation behind them – in spite of it having been an official expert body for more than half a century. Some respondents may also have been confused by the fact that the recommendations in question are not meant to be concrete instructions for individuals, but rather general recommendations for the population as a whole.

No clear dependencies can be identified by breaking the results down by population group. The highest score by a slight margin (56% consider the Council's recommendations to be the best) was given by those with professional qualifications in the health and welfare sector. The lack of variance mainly shows that the National Nutrition Council's recommendations are not directly criticised by any group.



