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Rathenau Instituut

Trust in Science in the Netherlands 2015

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The Rathenau Instituut regularly conducts surveys of the public's trust in science. The current publication presents the results of the 2015 survey and compares them with international results.

Summary

In the year 2015, the Dutch public continues to place great trust in science. Of the eight institutions they were asked to grade, the public awarded the scientific community the highest score. The results in some of our neighbouring countries reveal that this trust is not something to be taken for granted. Some countries have considerably lower scores, but others have even more trust in science. However, this trust is not unconditional. Scientists enjoy less trust once they are involved with parties such as the government or the industry. The public considers the independent position of scientists to be of the utmost importance. Scientists' roles in controversial issues are not always appreciated and can result in an immediate turn in public opinion. The respondent's level of education also influences the degree of trust in science; highly educated people have much more trust than the less educated.

Trust in science is influenced by the public's perception of what science is and what it means to them. On the whole, this perception is positive. We also asked the respondents what subjects they thought the scientific community should engage with in the future and the answers were clear. Issues related to public health were the most important. The social sciences and humanities, however, shared second place with the natural sciences and technology.

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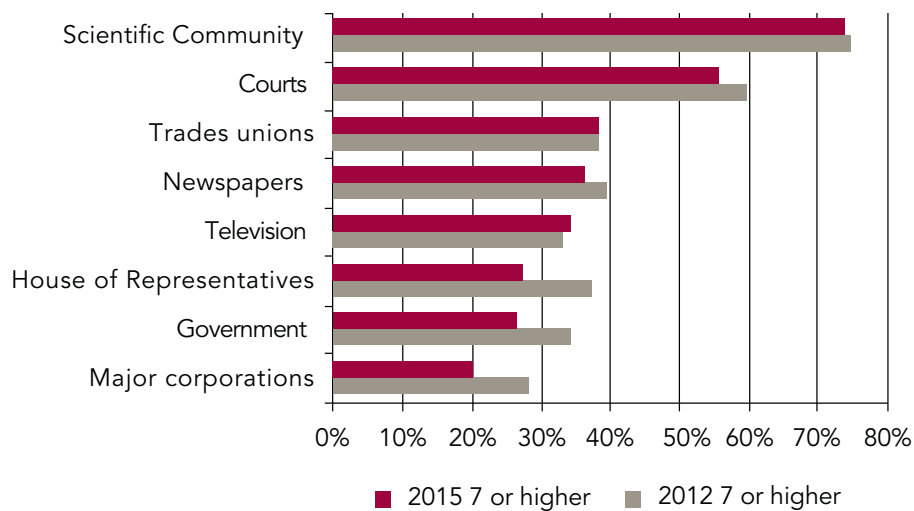
The Rathenau Instituut promotes the formation of political and public opinion on science and technology. To this end, the institute studies the organization and development of science systems, publishes about social impact of new technologies, and organizes debates on issues and dilemmas in science and technology.

1 What is trust in science based on?

The Social and Cultural Planning Office (SCP) conducts three-monthly surveys of the Dutch public's trust in various institutions.¹ Regrettably, these surveys do not include questions about trust in science. In 2010 and 2013, respondents were asked about their trust in various sources of information, including scientific institutions, on subjects such as climate change and vaccinations. This inspired us to apply the same method for a survey on trust in science. The trust in the eight institutions was measured for a representative sample of Dutch citizens. The Rathenau Instituut had earlier polled the public on trust in science, together with the Scientific Council for Government Policy (WRR) in 2012. This survey was repeated with more or less the same questions in the spring of 2015.

Trust was measured by asking the respondents how much trust they had in various institutions: television, newspapers, trades unions, courts of law, major corporations, the Dutch House of Representatives, the government and the scientific community. It proves that the public continues to place great trust in science. The average score was a 7.04, followed by the courts of law with 6.32, while the government, the House of Representatives and the major corporations were given a 5.0. Eighty-five percent of all the respondents had sufficient trust to give science a score of 6 or higher and 73% gave a 7 or higher. Figure 1 displays the percentages of scores of 7 and above for the various institutions in the 2012 and 2015 surveys.

Figure 1 Public trust in Dutch institutions; 2012 and 2015 surveys



Source: 2012 survey on trust in science (WRR and Rathenau Instituut), 2015 survey (Rathenau Instituut)

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The public has the most trust in the scientific community, followed at a short distance by courts of law, and then trades unions, newspapers and television. Politicians enjoy less trust, while the major corporations are at the bottom of the trust ladder. Compared with the survey three years ago, the scores have decreased more or less across the board, but the ranking has remained unchanged (with exception of some minor details).

These figures raise a question: what is this trust in science based on? What is the public's perception of science and which hopes and expectations do they have?

¹ SCP, Continuous Survey of Public Perceptions (Continu Onderzoek Burgerperspectieven)

The public's perception of science

In 2012 and 2015, the public was asked to describe what they associate with science. The same question was also asked in public meetings. The answers were consistent for all the surveys.

The large majority (70-92%) associate science with researchers at universities, but also businesses, medical specialists, cancer researchers, Nobel Prize winners and engineers (e.g. the Delta Works).

A smaller percentage (40-50%) of the public also associates science with meteorologists of the Royal Netherlands Meteorological Institute (KNMI), developers of teaching methods and developers of new materials, for example for sportswear.

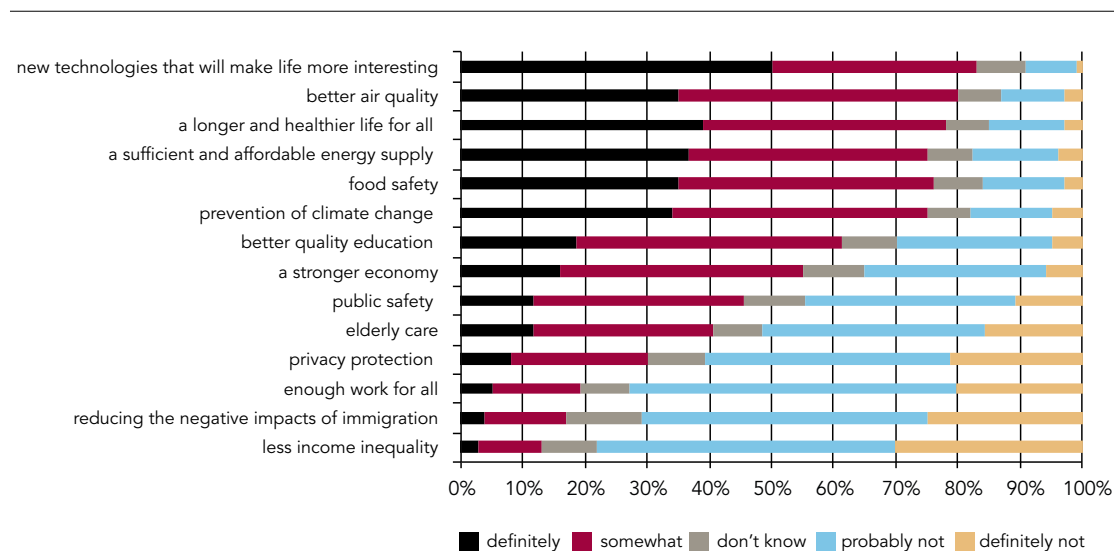
GPs, SCP researchers, designers of cars and the economists on TV are considered to be scientists by a small minority (20-35%).

The public were also asked what they associate with science in an open question. This produced mainly positive associations, such as 'progress' or 'smart minds'. Less than two percent of the answers to these open questions involved negative associations. The negative associations included terms such as 'fraud' and 'plagiarism', but also expressions such as 'inflated egos' or 'know-it-all's'. Almost no negative consequences of science were mentioned (a single respondent drew a relationship between science and wars).

Expectations of science

The public were also asked about their expectations of science and to what degree they think science contributes to certain facets of life, such as illness, the economy or food safety. The respondents were asked whether they thought science would make a contribution to solving the problems associated with fourteen different themes. The results are displayed in Figure 2 and ranked by the level of expectation.

Figure 2 Do you expect that science will contribute to ...



4 Trust in Science in the Netherlands 2015

The public has no or only very low expectations of science with regard to social issues such as income inequality and immigration, while they have high expectations in the area of new technologies, longer and healthier lives and the improvement of air quality. So the public has more faith that science will solve problems in the domains of healthcare and natural sciences and technology than that it will provide answers for social issues.

Less questions were posed in the 2012 survey, but there were similar differences between the themes.

The public's knowledge of science

The Dutch public has access to scientific information through various channels. 44% of the Dutch public uses newspapers or the internet (regularly or very often), 33% gets their information from the radio or television, 17% reads academic journals or popular science magazines and 27% discusses science with family and friends. Little has changed in comparison with 2012, with the exception of radio and television, which have become much more important as a source of scientific information. In 2012 only 18% used this source; in 2015 this was 33%.

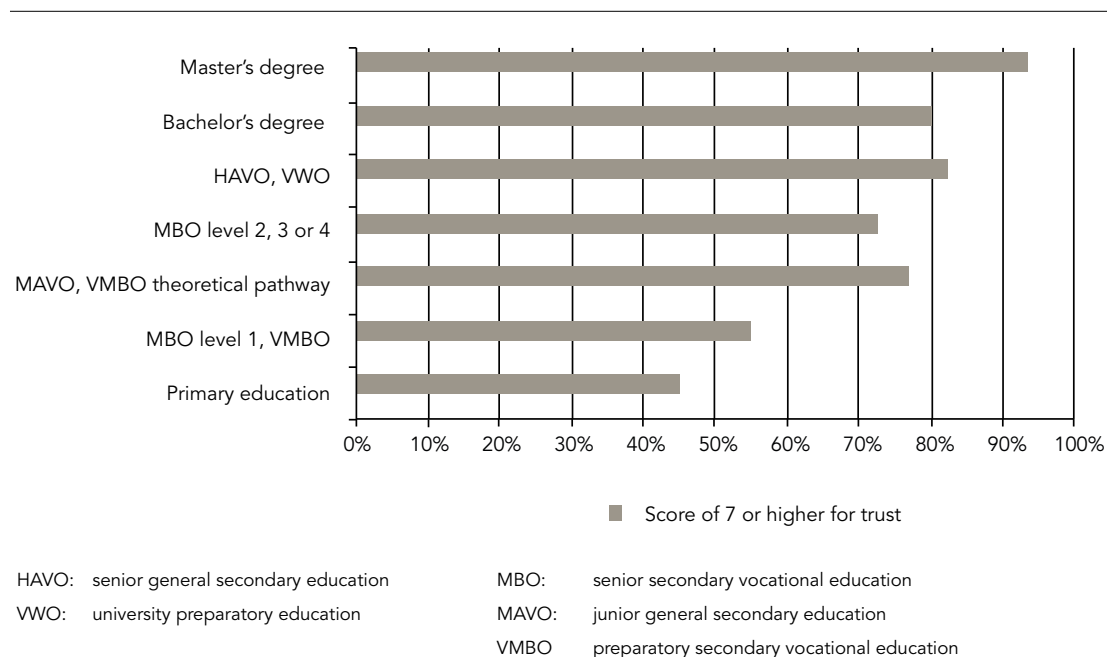
In answer to the question of how important science is to the public in their daily lives, 5% answered 'very important', 25% answered 'reasonably important', 50% said 'a little important' and the remaining 20% experienced science as 'unimportant' in their daily lives.

The 2014 Eurobarometer² revealed that the Dutch public is more informed of the state of science than the average EU country citizen, namely 47% in comparison with the EU average of 40%. A larger proportion also states that they are interested in science, being 68% versus the EU average of 53%.

2 Who has trust in science?

People have varying degrees of trust in science, ranging from no trust at all (a score of 1) to complete trust (a score of 10), while some have no opinion. We tried to distinguish patterns in the responses; differences between men and women, young and old or the level of education. This produced the following results.

Figure 3 The public's trust in science in relation to the level of education



Source: 2015 survey on trust in science (Rathenau Instituut)

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² Special Eurobarometer 419: public perceptions of science, research and innovation, Brussels, October 2014.

Most of the differences are found between people of varying education levels. Highly educated people clearly have more trust in science (92% gave a score of 7 or higher) than less well-educated people (45% gave a 7 or higher).

Alongside the level of education, the social position is also an important indicator (the level of education and the social position are also very closely related). Self-employed people and students of higher education institutions score the highest for trust, while unemployed people have substantially less trust. Employees in the public and private sectors have average scores.

The following criteria rendered only slight or no differences:

- Men have slightly more trust than women (7.09 versus 6.99).
- Age has no influence; young and old people score the same for trust in science.
- The amount of scientific knowledge of a respondent has hardly any influence on their trust in science. People with plenty of scientific knowledge may have little trust in science, and vice versa. There is only a weak link between the two.
- The degree to which people follow, read or talk about science in their daily lives also only has a minor influence. Those who regularly follow scientific news through television, the internet or newspapers and discuss it with family and friends give similar scores for trust as people who have nothing to do with science.
- There is no clear relationship between political orientation and trust in science (the weak relationship is statistically non-significant). People who consider themselves to be in the middle of the political spectrum do not have any more or less trust than those who consider themselves left or right.
- If, however, we compare the results of the most recent elections (2015 provincial council elections), then we see a somewhat more marked difference. People who voted for the VVD (People's Party for Freedom and Democracy) have the most trust in science, and people who voted for the PvdA (Labour Party), the Green Party, D66 (Democrats), Christian Union or the CDA (Christian Democrat Party) had very similar results (between 75 and 87% gave a score of 7 or higher). Those who voted for the Socialist Party, the SGP (Political Reformed Party) and the PVV (Freedom Party) scored lower; respectively 66, 59 and 58% gave a 7 or higher for trust in science.

3 High trust in science, but is this trust at stake?

Science as an institution receives high scores for trust. But science comes under pressure once scientific insights threaten to affect daily life and are given concrete form. As soon as scientists become involved in government policymaking or take commercial assignments then trust in them falls.³ Science clearly plays an important role in many public and political debates and science and scientists are often deployed on opposing sides of the political arena. They are at the middle of many of the important debates of our time, such as climate change, the energy supply, gas extraction, the use of gene technology for crop improvement, as well as the treatment of cancer.

The survey included questions about trust in science in relation to the specific situations of climate change and the outbreak of an infectious disease. Science has played a role in these controversial themes in the past. This is discussed in the publication *Contested science: Public controversies about science and policy* and examples include the IPCC report on climate change and the E. coli bacteria as the source of an outbreak.

3 *Contested Science – Public Controversies about Science and Policy*, Rathenau Instituut, 2014.

The respondents were asked which institutions they would trust with regard to information about climate change or information about an infectious disease. Next to science, in the case of climate change these were the ministry, environmental organisations, friends or family, the internet and the media. In the case of an infectious disease the environmental organisations were exchanged for healthcare specialists such as GPs and pharmacists, as well as the pharmaceutical industry.

In both cases, the respondents had a lot of trust in science. In the case of climate change, 75% had trust in science (the remaining 25% had little or no trust), the environmental organisations came in second place with 52%, while the government, the media, friends or family and the internet scored considerably lower with respectively 42, 28, 22 and 12%.

In the case of an infectious disease, the healthcare workers came in first place with 84%, followed closely by science with 82%. They were followed at some distance by the ministry (64%), the pharmaceutical industry (33%), the media (31%), friends or family (30%) and the internet (17%).

This demonstrates that science continues to be seen as a reliable source of information in concrete situations, even if it concerns controversial themes. It is obvious that science cannot enjoy the trust of everybody all the time; depending on the theme, there will always be a part of the public that has no trust in science. Normally, this population group will also have little trust in the other institutions, although there are exceptions. For example, we distinguished a group with no trust in science, but who do trust the environmental organisations.

Science is not conducted in a vacuum. The scientists themselves may or may not inspire trust, they may be forced in a certain direction by the process of science itself, or they may be influenced by the stakeholders in their research (including possibly financial stakeholders). Well-known examples in the Netherlands, such as psychologist Diederik Stapel and medical specialist Don Poldermans, have managed to unsettle the scientific community considerably. Abroad, the American cardiologist John Darsee is probably among the most well-known fraudulent scientists. It is not known whether such cases undermine the public's trust in science, but we do know that in countries like the United States and the United Kingdom, no major fluctuations in trust occurred in spite of such cases becoming public.

The survey on trust in science included questions about how this trust was affected by the complex interplay of dependency and independency on stakeholders such as businesses and the government, and questions about fraud and the role of universities in preventing it. The complete overview is included in the appendix. The results were by no means clear-cut. On the one hand, these things tend to decrease trust. There are more people thinking you should distrust scientists if their work is financed by business than those who still trust them in these circumstances. And more people think scientists often contradict each other, than those thinking the opposite. Many people also think that the results of science are less certain than the scientists themselves claim (36% believe this is the case, 15% do not). They also believe that scientists with different opinions are regularly forced to keep silent about these opinions.

On the other hand, respondents say they have more trust in the way scientists work in relation to their scientific environment. Some of the respondents think that scientists modify their data to get the right results (20%), or that they are forced to commit fraud by the pressure to publish (18%), or that the universities are incapable of preventing fraud (16%). However, twice as many respondents believe exactly the opposite.

Respondents had the strongest opinions on the subject of independence, integrity and the value of investments in science. The great majority (74%) think scientists should be independent of the government, businesses and social groups, while only 6% do not think this is important. Moreover, ten times as many people think scientists are honest and reliable than the group that does not (6%). Finally, eight times more people think investments in science are worth the money than people who do not.

All the statements have a clear relationship with the earlier mentioned generic trust in science. The group who think that scientists commit fraud and who mistrust scientists if they are financed by business clearly has less trust in science than other respondents. The often relatively large group who answered “don’t know” in response to the statements also generally has low trust in science in general.

4 The Netherlands versus the reference countries

The Netherlands is not the only country that thinks it is important to measure trust in science. Some other countries have been doing this for decades. The surveys differ per country, so the results cannot always be compared. The only survey that can serve as a truly reliable basis for comparing various countries is the Eurobarometer. This instrument of the European Commission is used to measure public opinion on a range of different themes.

The Eurobarometer

The European Commission has long had an interest in the public’s perceptions of science. Surveys were conducted on this subject starting in the late 1970s and continued through 2014.⁴

Special Eurobarometer 419 included an international comparison of public attitudes to science.⁵ In this survey, representative samples of citizens of all 28 EU countries (1000 per country) were asked about their expectations of science. However, the expectations that citizens have of science are not the same as their level of trust. These are separate, but nevertheless strongly connected, concepts. Trust in science is based on expectations, such as the expectation that science will make a positive contribution to a longer, healthier and more interesting life. But then these expectations have to come true.

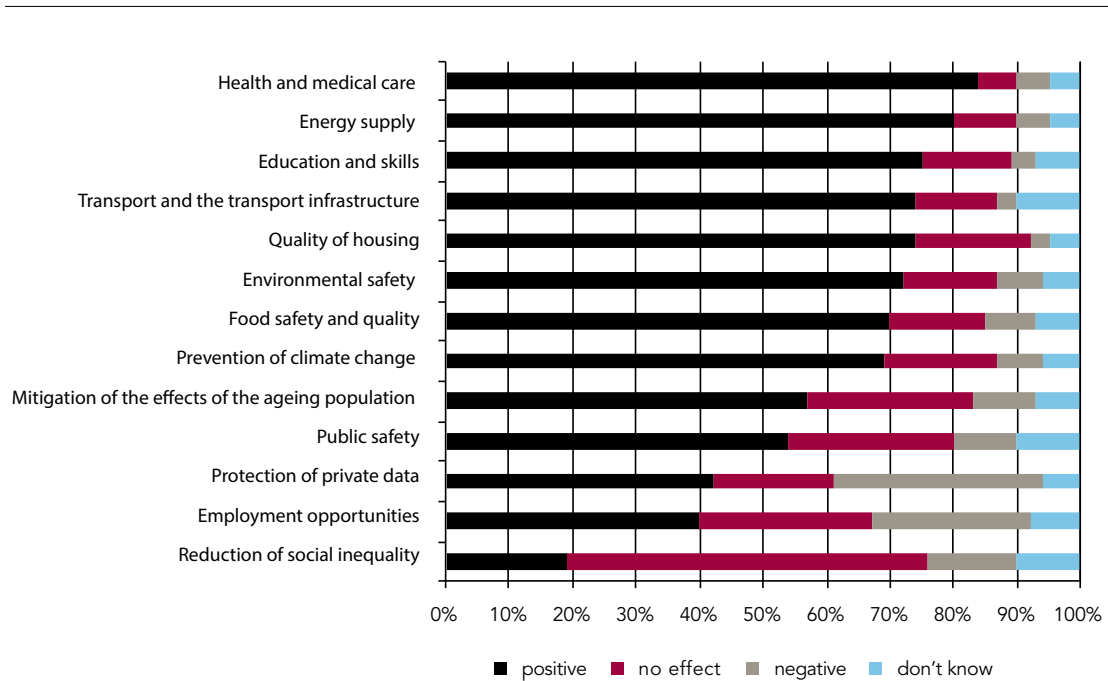
This Eurobarometer did not compare trust in science with trust in other institutions, as did the Rathenau Instituut’s survey (using the SCP’s survey as a template). Instead, the European public were asked whether they expected that science would have a positive influence on thirteen different themes over the next fifteen years from the survey date.

The answers given by the Dutch respondents are summarised in Figure 4. The uppermost themes are those in which the public had the most confidence that they will be influenced positively by science, while the lowermost themes were expected to be the least positively influenced.

4 The Special Eurobarometers with the numbers 7, 11, 43, 76, 340 and 419 surveyed public attitudes on various themes. No. 282 surveyed science in the media and no. 401 was about responsible research and innovation. http://ec.europa.eu/public_opinion/archives/eb_special_en.htm.

5 Special Eurobarometer 419: Public perception of science, research and innovation, October 2014.

Figure 4 Dutch citizens' expectations of science in the Eurobarometer survey
Do you expect science to have a positive or a negative influence?

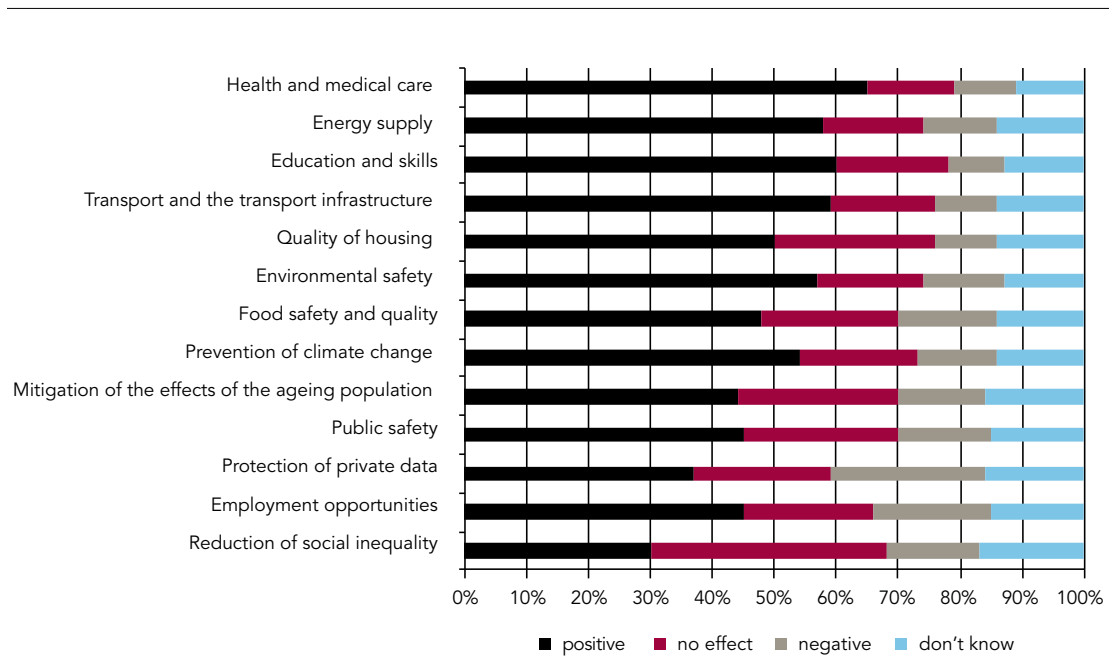


Source: Special Eurobarometer 419 (modified by the Rathenau Instituut)

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The average of all these scores is 62% positive, 20% expects no effect, 10% expects a negative influence and 7% does not know. The Dutch public have indicated in this Eurobarometer that they expect science to positively influence a wide range of themes. However, there are clear differences between the themes. The themes that scored below average were the social themes, while the mainly technical and healthcare related themes clearly scored higher. The 'Education and skills' theme was an exception; this theme was also given a high score. Figure 5 displays the expectations for the entire EU.

Figure 5 European citizens' expectations of science in the Eurobarometer survey
Do you expect science to have a positive or a negative influence?



Source: Special Eurobarometer 419 (modified by the Rathenau Instituut)

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When we compare the scores of the Dutch public with those of the entire EU, we see that Dutch attitudes to science are more positive on average (62% versus 50% for the EU). The rankings in both graphs are similar however. Alongside being more positive, the Dutch public are also more explicit; their high scores are higher and their low scores are lower than the EU averages, i.e. the scores are more extreme. Furthermore, the Dutch also are more explicit in their opinion; other Europeans selected 'don't know' more than twice as often (14% versus 7% for the Dutch).

This is also visible in the Netherlands' ranking among the 28 countries per theme. The Netherlands was in first place with the highest scores for trust in science in relation to the themes of health, housing and food security, and they scored well above average for most other themes. They gave average scores for the protection of private data and public safety, while they gave among the lowest scores for expectations of science in relation to employment opportunities and the reduction of social inequality.

Reference countries: United States, United Kingdom, Germany, Sweden

The Netherlands is not the only country where public trust in science is measured. Each country has its own tradition of monitoring this phenomenon. Countries like the United States and the United Kingdom have the longest tradition, while Germany and Sweden are increasingly showing more interest. In 2015, the OECD conducted an inventory of countries that survey the public's perceptions of science and technology.⁶ The OECD report describes seventeen countries in the world that conduct such research (including Australia, Mexico, Japan, Chili, Korea, Russia, Colombia and a number of European countries). The countries do not share a methodology and each has its own priorities. The reason that most countries started surveying was the assumption that trust in science had reached a critical low, yet the surveys revealed that this trust was higher than expected and that there was no sign of a crisis situation. This was also the case in the period leading up to the first Rathenau Instituut survey in 2012.

⁶ Measuring the societal dimension of science, technology and innovation, OECD, 2015.

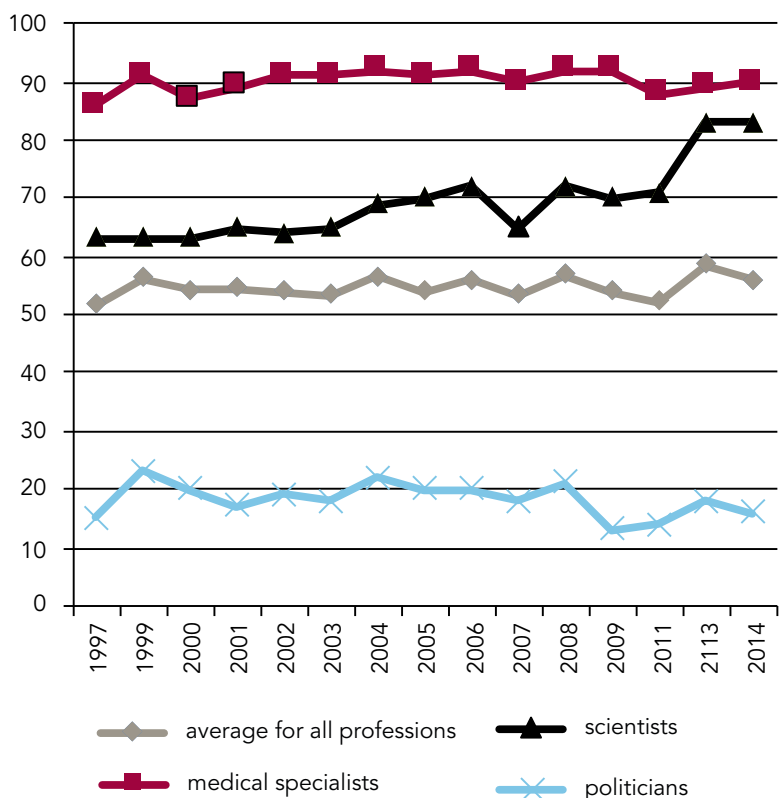
United Kingdom

The United Kingdom conducted its own surveys and was also included in the 2014 Eurobarometer survey. The Eurobarometer survey reveals that the public of the United Kingdom scores slightly higher for trust in science than the European average, and thus significantly lower than the public of the Netherlands (62% positive in the Netherlands, 51% in the United Kingdom and 50% in the EU). The ranking of the individual themes also closely resembles that of the Netherlands; the people of the UK have high expectations of a positive influence on healthcare and low expectations for themes such as social inequality, employment opportunities, the protection of private data and public safety.

Surveys on public trust in various occupational groups are conducted nearly every year in the UK. In these surveys, respondents are asked about their trust in 16 professions, including GPs, physicians, politicians, journalists and scientists. The surveys on trust in institutions in the UK started in 1983, while those that specifically mentioned scientists started in 1997. Scientists score highly for trust in the UK, as do medical specialists, teachers and judges. The lowest scoring professionals in the UK are politicians, government ministers and journalists.

The table below depicts the development in trust since 1997, whereby scientists are ranked in comparison to the highest scoring occupational group (medical specialists), the lowest scoring occupational group (politicians) and the average for all groups.

Figure 6 Trust in members of various occupational groups in the UK (including scientists)⁷



Source: Ipsos MORI 2014 (modified by the Rathenau Instituut)

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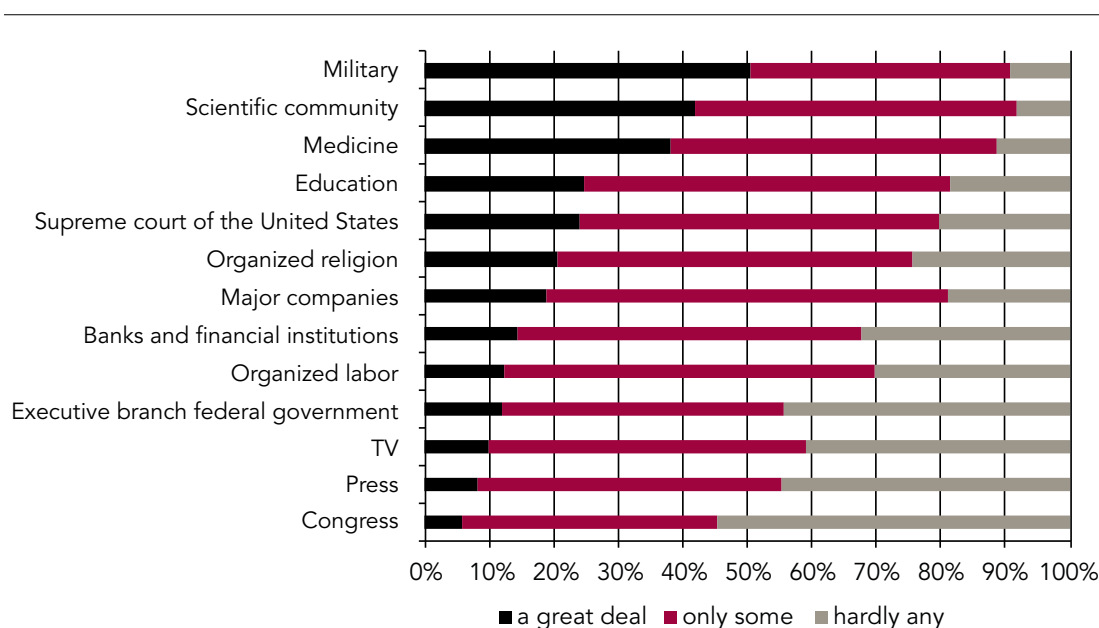
⁷ Respondents were asked if professionals in the relevant occupational groups were truthful (possible answers were 'tell the truth', 'not tell the truth', 'don't know').

While the average trust score for sixteen professions in the UK varies between 50 and 60% (with medical specialists scoring highest and politicians scoring lowest), the respondents in the UK have increasing trust in scientists. The most recent surveys in 2013 and 2014 revealed the most substantial increases in trust. These surveys can be used for making comparisons over time, but not for comparing with other countries, as is possible with the Eurobarometer.

United States

The US also has a long tradition in trust in science surveying. Since 1973, trust in various specific institutions has been measured in the General Social Survey, which is conducted by the University of Chicago on behalf of the National Science Foundation. The results of the most recent survey, the 2014 survey, are displayed in the following table.

Figure 7 Trust in institutions in the US⁸



Source: General Social Surveys 1972-2014, cumulative Codebook University of Chicago 2015, (modified by the Rathenau Instituut)

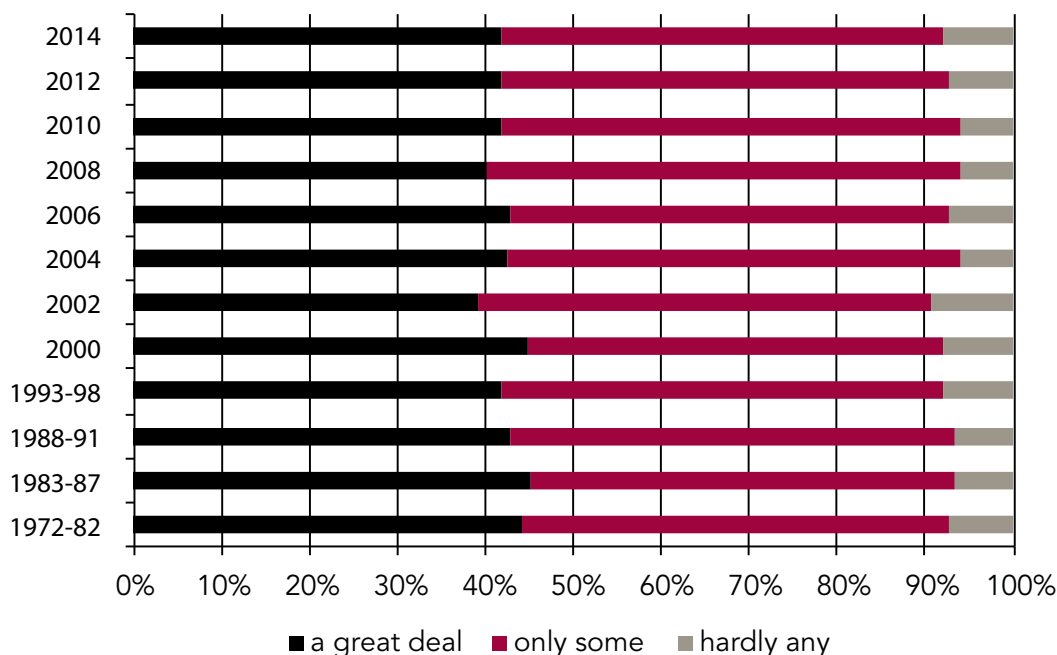
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The table reveals that the scientific community scores highly for trust (just as in the Netherlands and the UK). Only the military score higher (trust in the military was not measured in the Netherlands or the UK). The scores of the other institutions were also similar; medical specialists scored highly (as they also do in the UK), while politicians and the media were given low scores (as they were in the Netherlands and the UK).

The following table displays the development in trust in science over a period of more than forty years.

⁸ The answer options were: 'a great deal', 'only some', and 'hardly any'.

Figure 8 Trust in the scientific community in the US over the years



Source: General Social Surveys 1972-2014 cumulative Codebook University of Chicago 2015, (modified by the Rathenau Instituut)

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The obvious conclusion is that little has changed. Trust in the scientific community was high forty years ago and it has remained high ever since, with only minor fluctuations.

In the US, respondents reported on a war on science, which was mainly carried out by republicans during the presidency of George Bush and which focussed on climate change. Our 2013 publication presents Gauchat’s analysis, which reveals that Americans who consider themselves politically conservative have been losing trust in science over an extended period.⁹ Yet, at the same time the ‘liberals’ trust in science has been increasing, so that the average remains more or less stable. This loss of trust among political conservatives in the US is the only clear decrease in trust in science that was measured. No other countries have recorded such a decrease, not even among their more conservative populations.

Germany

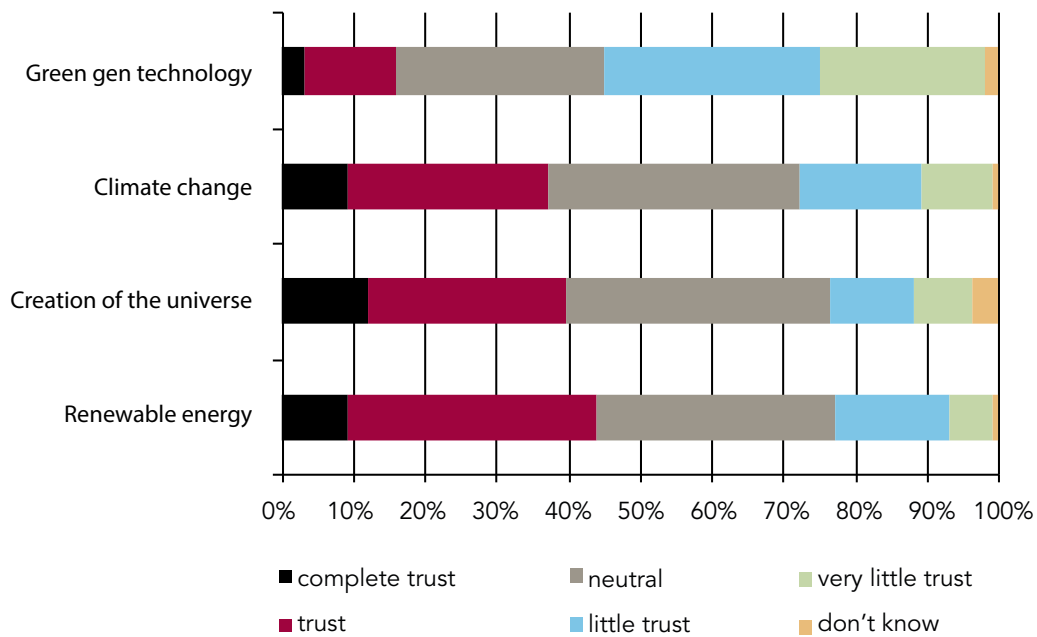
Germany was also surveyed as part of the 2014 Eurobarometer. This revealed very different results to those of the Netherlands, the UK and the EU average. While 62% of the Dutch respondents were fairly positive about the themes surveyed in the Eurobarometer (versus 51% in the UK and 50% in the EU), Germany scored significantly lower with 43%. The detailed scores per theme are provided in the appendix. The rankings were once again similar: healthcare scored highest and the reduction of social inequality scored lowest.

⁹ Gauchat, G (2012). Politicization of science in the public sphere. A study of public trust in the United States, 1974 to 2010 in; American Sociological review 77, no. 2, pp 167-188.

Germany recently started surveying trust in science. The *Wissenschaftsbarometer*, an important German survey, was conducted for the first time in 2014 and repeated in 2015. The *Wissenschaftsbarometer* is one of the products of the *Wissenschaft in Dialog* programme that was launched in 1999. The programme is financed by the Ministry of Education and Science (*Bundesministerium für Bildung und Forschung*).

The questions in this survey were structured differently again; respondents were asked whether they had trust in scientists' statements on four themes.

Figure 9 Trust in science on specific themes in Germany



Source: *Wissenschaftsbarometer* 2015 (modified by the Rathenau Instituut)

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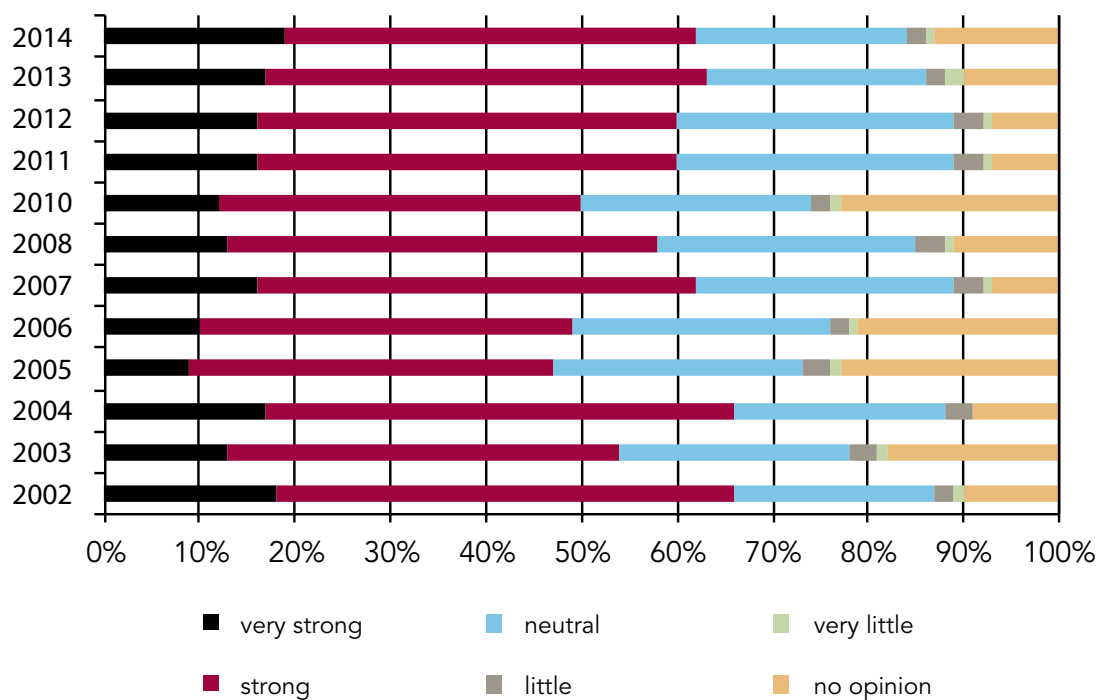
On average, 37% had trust in science with regard to these themes, and 29% had little trust. The 2015 survey (above) produced slightly higher scores for all themes (3% higher on average). Although this line of questioning is different to the Eurobarometer, because of the explicit reference to 'lack of trust', the results do appear to confirm the findings in the Eurobarometer; the German public is significantly more critical about science than the people of the Netherlands.

Sweden

The results of the 2014 Eurobarometer clearly reveal that the Swedish respondents are confident in the various institutions. With an average of 67%, Sweden has a higher average score than the Netherlands (62%), and much higher than the EU average (50%). A very low percentage had no opinion (6%).

Trust in science in Sweden has been measured annually since 2002 (with the exception of 2009) by *Vetenskap & Allmanhet* (<http://v-a.se>). The fundamental question in their survey is whether the public have trust in science. The results are provided in the following table.

Figure 10 Trust in science in Sweden¹⁰



Source: Vetenskapen i Samhället. Vetenskap & Allmänhet report 2015:2 (modified by the Rathenau Instituut)

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The level of trust has fluctuated somewhat over the years, with an average of 58% and a slight increase since 2011. The remaining respondents either had no opinion or were neutral. The groups with little or very little trust in science make up only 3 to 4% of the total.

5 Trust and participation

Initiatives to involve the public in science

There are many ways in which the public can become more acquainted with science and scientists, e.g. via media such as television, radio, newspapers and the internet, via friends and acquaintances and of course by getting actively involved in science (as a professional or as a volunteer via *citizen science*). Visits to science museums, zoos and university events (such as the 'Night of Art and Science') are also ways to become acquainted with science and technology.

The engagement of stakeholders (the public and the business community) in science is a worthy cause and should be encouraged wherever possible. This is the starting point of the future visions of the Association of Dutch Universities (VSNU), the Dutch Minister for Education, Culture and Science and the Dutch National Research Agenda. This is also an important theme abroad, although different countries have their own priorities and traditions. A brief overview of the activities:

- **Denmark:** the Danish Board of Technology¹¹. Consensus model, *world wide views* (global warming: 2009, biodiversity: 2012, public participation following the Paris agreement on climate and energy: 6 June 2015).

¹⁰ 'Förtroende för forskare': trust in researchers.

¹¹ After going through a rough patch some years ago, this organisation has made a new start under the title of the 'Danish Board of Technology Foundation'.

- **Germany:** *Wissenschaft in Dialog* was launched in 1999 and is an initiative of Germany's leading scientific organisations. It organises science nights, school parliaments, network meetings on various themes, science cafés and *citizen science platforms*. Two years ago they also started measuring public perceptions of science in the *Wissenschaftsbarometer*.
- **Sweden:** In Sweden, the organisation charged with encouraging the dialogue between the scientific community and the public is *Vetenskap & Allmanhet*. It was founded in 2002 and is supported by eighty organisations, including universities, businesses and umbrella organisations. They conduct research and organise debates and meetings for scientists and the public. They also have special projects to enable school pupils to participate in real scientific research and they coordinate the 'Researchers' Night'; the annual European science festival. Sweden holds this festival at seventeen different locations.
- **United Kingdom:** Public participation in science has been gaining increasing attention since 2000. A selection of key activities:
 - 2008-2012: *Beacons for public engagement*
 - *Sciencewise: expert resource centre for public dialogue in science and innovation*
 - UK Charter for science and society: <https://scienceandsociety.blog.gov.uk/uk-charter-for-society/>
 - Research Councils UK - *Concordat for Engaging the Public with Research* www.rcuk.ac.uk/Publications/policy/perConcordat/

Public participation in science in the Netherlands

The Netherlands also has a long tradition of bringing science and the public closer together. There are various science museums (e.g. Nemo, Naturalis, Corpus and Museon) and festivals, such as 'The Night of Art & Knowledge', 'The Night of Art and Science' and the 'Twente Science Night'. The Rathenau Instituut also plays an explicit role in bringing the public and science together by means of research and organising debates.

In 2015, the Dutch National Research Agenda was initiated in which the public were asked to submit questions to the scientific community. One of the assumptions behind the Minister's vision and the Dutch National Research Agenda is that the public wishes to participate in determining the priorities of scientific research. But is this the case?

We asked the public to indicate their desired level of participation in response to four statements:

1. I do not need to have a say in determining the priorities of scientific research, as long as the scientists do their work properly.
2. I think it is important that the wider public has a say in determining the priorities of scientific research, but I do not need to participate myself.
3. I would like to have more of a say in determining the priorities of scientific research.
4. I am already actively involved in determining the priorities of scientific research.

This survey reveals that a portion of the public would like to help determine what subjects the scientific community focuses its research on. 27% think this should be an option (answer 2) and 15% would personally like to participate (13% chose answer 3 and 2% chose answer 4). This means that 58% of the population chose the first answer and is not interested in determining the priorities of scientific research.

Highly educated people clearly were more interested in participating (22%) than less educated people (primary education, 8%; pre-vocational education, 5%). However, it is by no means the case that only highly educated people are interested in participation. The large group with a senior secondary vocational education (MBO level 2,3 and 4) scored almost as high as the national average (12%). There are no major differences between men and women; men are slightly more often actively involved than women, yet, women more often wish to have a personal say in scientific research.

A similar question was also put to the public in the UK. The UK public clearly has a stronger wish than the Dutch to participate in determining the priorities of scientific research. Where 58% of the Dutch public does not need to have a say, in the UK this is 24%. 31% wishes to be personally involved in the decision-making (as opposed to 15% in the Netherlands) and 43% believes that the public should participate, though not necessarily they themselves.

The Swedish public has an even greater desire to participate: 53% wishes to have a personal say in determining the priorities of scientific research, while 34% think public participation is important, but do not necessarily need to participate personally (VA barometer 2014-15).

The question was put differently in the German *Wissenschaftsbarometer*: 'It is important for people like myself to be involved in decisions on science.' 34% of the respondents agreed with this statement.

In the 2015, Rathenau Instituut survey, respondents were asked if they were familiar with the Dutch National Research Agenda.¹² 2.6% of the respondents said they were. The large majority (77%) had no idea what it was, while 20% had heard of the National Research Agenda but did not know exactly what it was.

There was a clear division among the respondents who were familiar with the Dutch National Research Agenda. Highly educated people were clearly more in the picture (14% knew what it was and another 39% knew it by name). Men scored fractionally higher for familiarity than women. Self-employed people (12% knew what it was and 17% knew it by name) and government civil servants (9% knew what it was and 24% knew it by name) were also more often familiar with the National Research Agenda than the average respondent.

What are the priorities of scientific research?

The 2015 survey asked the public to prioritise scientific research by defining its monetary value; they were asked how they would divide money for research between the various themes.

The public was asked to divide a sum of €100 million between a number of themes in three domains: 'healthcare', 'natural sciences and technology' and 'social sciences and humanities'. Six themes were provided per domain, so there were eighteen in all, and the respondents were also allowed to suggest their own themes. These suggestions were later brought under one of the three domains. Each respondent was given three times three random themes to choose from plus the additional option to suggest their own theme.¹³

The themes in the healthcare domain were allocated half of the available sum (50.8%). The two other domains were allocated about a quarter each (natural sciences and technology 24.5% and social sciences and humanities 24.7%). The open questions produced a similar distribution, with 46.3% for healthcare, 27.3% for natural sciences and technology and 26.7% for social sciences and humanities.

The survey also measured how the priorities were influenced by factors such as education, age and gender, but these influences proved minimal. The priorities were fairly consistently independent of age, level of education, level of urbanisation and employment situation. There was further almost no difference between the pattern of priorities in the predefined themes and those suggested by the respondents.

When we compare the expenditure with the expected amounts based on the other surveys, we can see that the high expenditure on healthcare is consistent with the high expectations the public has of this institution. This was less pronounced for the social themes. The public has relatively low expectations of the social sciences, but they are willing to spend a significant amount of money on them (a quarter of the total). In the natural sciences and technology theme we see that the public has high expecta-

¹² Reference date: May 2015.

¹³ The details per theme and the amounts allocated to each theme are provided in the appendix.

tions, but that they are not prepared to spend accordingly. In other words: the public attaches considerable importance to various social themes, yet, they do expect the scientific community to produce wonders. In contrast, they have high expectations of science for the solution of problems in the domain of natural sciences and technology (new technologies, air quality, energy), however they only set aside an average budget to this end.

Appendix 1 Method

This survey was conducted in 2012 and again in 2015 by the Veldkamp agency. The TNS NIPObase was the source of the data for the random sample. This is a database of households who are willing to participate in regular surveys by Veldkamp and TNS NIPO. The questionnaires are completed online.

The data for the survey is collected using a *computer assisted self-interviewing questionnaire* (CASI). The initial random sample was N=1,100 persons, whereby representativeness in gender, age, household size, level of education, social class and region was sought. The random sample was taken using the normative figures from the 2014 'Golden Standard' (*Gouden Standaard*). The random sample consisted of persons of 18 years and older. In order to assure the minimum required response (800), a second random sample of N=350 was taken later in the research. The total random sample was thus 1,450 persons of 18 years and older (> 55% response).

This survey on trust in science was inspired by SCP research (the Continuous Survey of Public Perceptions). The survey has been repeated every three months since the start of the research in 2008 and polls a number of 'fixed' themes, one of which is the public's trust in seven different institutions. The responses take the form of a 10-point scale, whereby the respondents are asked the following question: 'Can you indicate whether you do or do not have trust in the institutions below?'

Most of the questions used for the 2012 survey were the same for the 2015 survey. Because the methods of questioning and sampling were identical, the responses to the identical questions can be compared over time.

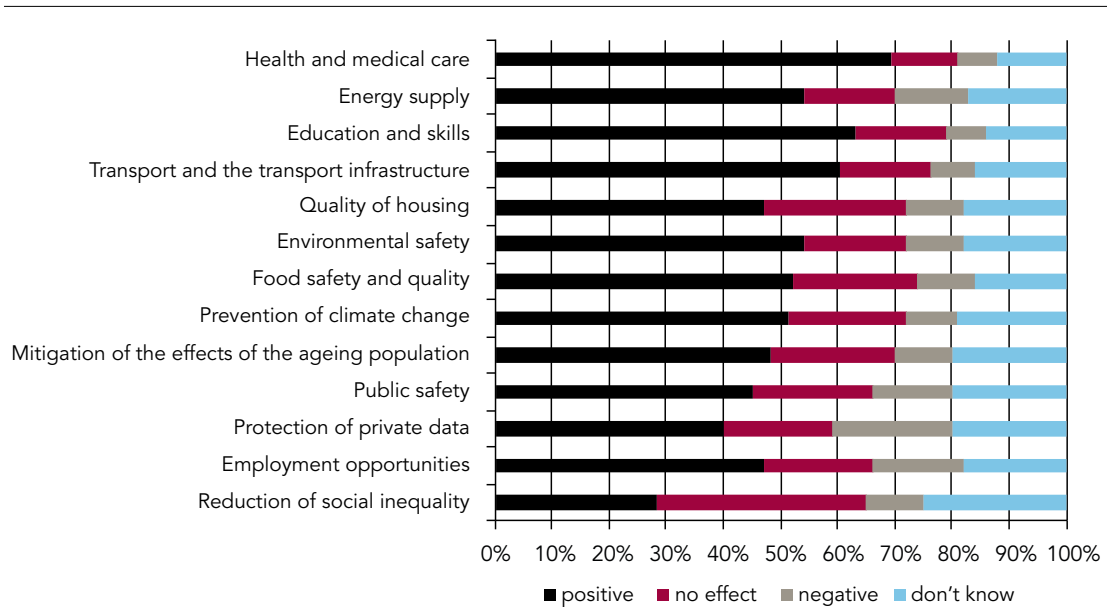
The 2015 survey asked a number of additional questions that were relevant to the Dutch National Research Agenda.

Appendix 2 Tables in detail

Figure B1 Statements about science; 2015 survey

	agree	disagree
It is a good thing that scientists are independent of the government, business and social groups in their choice of research themes.	73.5%	6.4%
The vast majority of scientists are honest and reliable.	58.4%	5.7%
The investments in science are worth the money.	53.6%	6.6%
Scientists with a different opinion are regularly forced to keep this opinion silent.	46.8%	16.4%
Scientific results can easily fall into the wrong hands, putting our privacy and safety at risk.	42.7%	20.1%
Scientific knowledge is often less certain and reliable than the scientists say.	36.2%	14.8%
You should not trust scientists if their research is paid by the industry.	37.6%	21.5%
Scientists are always contradicting each other, so you cannot know what the truth is.	32.3%	21.2%
You can trust in what a scientist tells you.	22.8%	27.5%
Scientists modify their research data to get the answers they want.	19.9%	34.1%
Scientists are practically forced to commit fraud because of the pressure to publish.	18.4%	44.6%
The universities ensure that scientists have almost no opportunity to commit fraud.	16.2%	36.6%
The problems we face today are so complicated that scientists are no longer able to help find the answers to them.	14.6%	48.3%

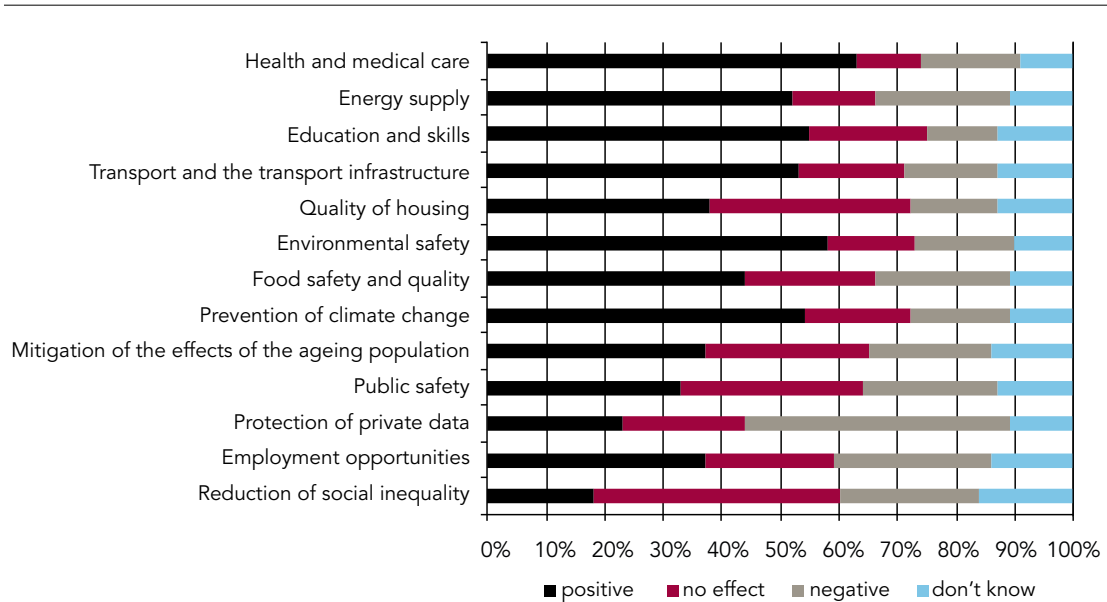
Figure B2 Eurobarometer for the United Kingdom



Source: 2014 Eurobarometer (modified by the Rathenau Instituut)

Rathenau Instituut

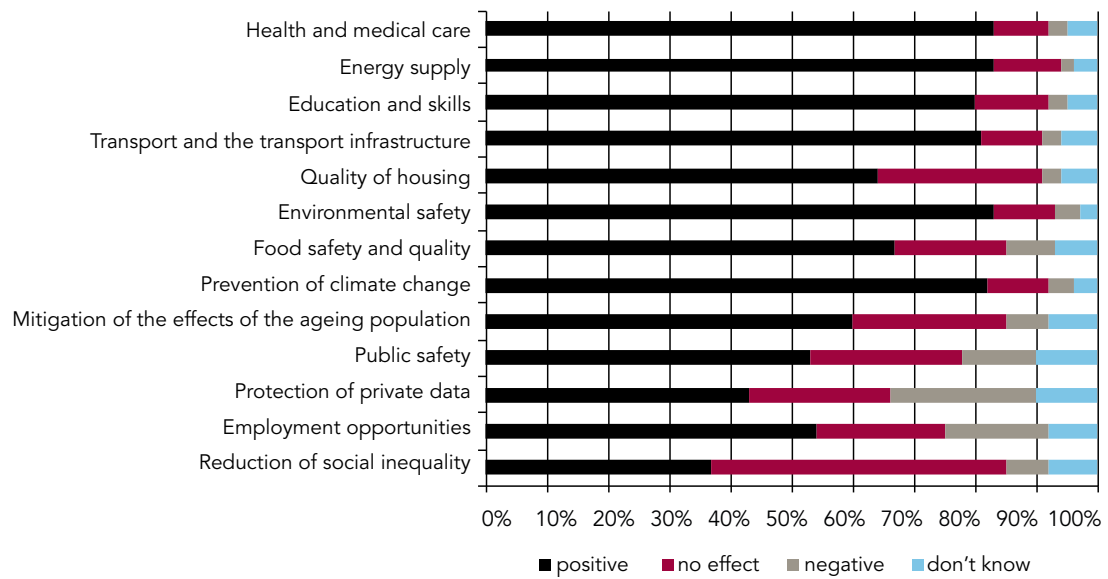
Figure B3 Eurobarometer for Germany



Source: 2014 Eurobarometer (modified by the Rathenau Instituut)

Rathenau Instituut

Figure B4 Eurobarometer for Sweden



Source: 2014 Eurobarometer (modified by the Rathenau Instituut)

Figure B5 How much is the public willing to pay for the various themes?¹⁴

	% of budget	
Healthcare domain		50.8%
– What causes rheumatism and how can we prevent it?	7.8%	
– What causes cancer and what can we do if you get this disease?	14.9%	
– How does our immune system respond to viruses and infections?	7.8%	
– What causes dementia and how can we prevent this disease?	7.9%	
– How do biochemical processes take place in living cells?	5.0%	
– What do we need to eat and drink to live more healthily?	4.9%	
– (Open questions on healthcare)	2.5%	
Natural sciences and technology domain		24.5%
– How are stars and planets born and how do they die?	2.0%	
– How can we improve criminal investigation methods in order to prevent crime?	4.5%	
– What are the causes and consequences of climate change?	6.5%	
– How can we build more energy-efficient homes?	2.8%	
– Which small particles and forces are found in all matter?	2.0%	
– How can we discover new plants and animals?	5.3%	
– (Open questions on natural sciences and technology)	1.5%	

¹⁴ Actual question: 'The following question concerns what you do and do not think is important with regard to the themes that scientists should conduct research on. If it was up to you, what would you spend money on? You can divide €100 between the nine themes below and you can also suggest your own theme. You can spend more on the themes you think are important and give no money to the themes you think are unimportant. You can spend all the money on one theme or divide it between the various themes.'

	% of budget	
Social sciences and humanities domain		24.7%
– How can we improve Dutch-language teaching programmes for young children?	4.6%	
– How can we prevent terrorism?	6.7%	
– How can we improve our predictions of economic developments?	2.9%	
– What do languages teach us about the past?	1.6%	
– How can you treat behavioural disorders in children?	5.4%	
– How do ancient civilisations influence our modern culture?	2.2%	
– (Open questions on social sciences and humanities)	1.4%	

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F&F 2	Steen, J. van (February 2009) <i>Public Research Institutes in the Netherlands – Facts and Figures 2</i> . The Hague: Rathenau Instituut.
F&C 3	Meulen, B. van der, J. Dawson, J. van Steen (February 2009) <i>Organisatie en governance van wetenschappelijk onderzoek, een vergelijking van zes landen – Feiten en Cijfers 3</i> . Den Haag: Rathenau Instituut.
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