



Special Eurobarometer 516

European citizens' knowledge and attitudes towards science and technology

Report

Fieldwork: April-May 2021



Survey conducted by Kantar at the request of the European Commission,
Directorate-General for Research and Innovation

Survey co-ordinated by the European Commission,
Directorate-General for Communication (DG COMM “Media monitoring and Eurobarometer Unit”)

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INTRODUCTION



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Fostering science and innovation is a central priority for the European Union (EU). EU support for research and innovation aims to improve the quality and quantity of research and innovation conducted, ensure that the processes and outcomes of research and innovation align with the needs, values and expectations of society, and address the many pressing issues that face us as individuals, as society, and as a planet.

Through its multiannual research and innovation framework programmes (currently Horizon Europe), the EU provides funding to:

- Strengthen the EU's position in science;
- Promote industrial innovation, including investment in key technologies, greater access to capital, and support for small businesses;
- Address major societal concerns, such as climate change, sustainable transport, and renewable energy;
- Ensure technological breakthroughs are developed into viable products with real commercial potential – by building partnerships with industry and governments;
- Step up international cooperation on research & innovation¹.

Horizon Europe, the EU's major Research and Innovation programme, is the successor to Horizon 2020. It is the EU's key funding programme for research and innovation with a budget of €95.5 billion. It aims to support scientific excellence, tackle climate change, help to achieve the UN's Sustainable Development Goals, and boost the EU's competitiveness and growth².

This Special Eurobarometer report provides an insight into perceptions of science and technology. The survey covers the following topics:

- Knowledge about science and technology, including interest and understanding in the subject, sources of information and belief in conspiracy theories;
- Views on the impacts of science and technology, including the influence of science on society, and the risks and perceived benefits of new technologies;
- Views on the governance of science and technology, and attitudes regarding public access to research results;
- Attitudes towards scientists, including their perceived characteristics, credibility, and views on the role(s) that they should play in society;
- Citizens' engagement in science and technology, including preferred level of public involvement in decision making about science and technology and current – and ideal – levels of engagement;
- The comparative advantage of the EU in science and technology compared with other parts of the world.

The survey continues in the tradition of a long line of surveys stretching back to the late 1970s. In order to show trends over time, the report includes trend comparisons with the following previous Eurobarometer surveys:

- EBS 225: Social Values, Science & Technology (2005)³;
- EBS 340: Science and Technology (2010)⁴;
- EBS 401: Responsible Research and Innovation (RRI), Science and Technology (2013)⁵.

This Eurobarometer survey, commissioned by the European Commission's Directorate-General for Research and Innovation, was carried out by the Kantar network between 13 April and 10 May 2021. Some 26,827 respondents in the 27 EU Member States were interviewed in their mother tongue and the data was weighted to be socio-demographically representative at country level. The survey was also conducted in 11 other countries or territories, where a total of 10,276 respondents were interviewed in their mother tongue: five candidate countries (Albania, Montenegro, North Macedonia, Serbia and Turkey), as well as Bosnia and Herzegovina, Iceland, Kosovo⁶, Norway, Switzerland and the United Kingdom. In total, 37,103 respondents from EU and non-EU countries and territories took part in the survey.

The methodology used was that of a Standard Eurobarometer survey, as carried out for the European Commission's Directorate-General for Communication ("Media monitoring and Eurobarometer" Unit). Given the impact of COVID-19 and subsequent health safety measures, face-to-face interview methodology was not always possible:

- In Austria, Bulgaria, Croatia, Cyprus, France, Germany, Greece, Hungary, Italy, Poland, Spain, as well as Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, Serbia, all interviews were conducted face to face;
- In Denmark, Malta, the Netherlands, Slovenia, Slovakia and Turkey face-to-face interviews were complemented by online interviews;
- In Belgium, Czechia, Estonia, Finland, Iceland, Ireland, Latvia, Lithuania, Luxembourg, Norway, Portugal, Sweden, Switzerland and the United Kingdom all interviews were conducted online.

A technical note on the manner in which the interviews were conducted by the institutes within the Kantar network is appended after the main text of this report. Also included are the interview methods and the confidence intervals.

This summary report provides a broad overview of selected results. For the full results of the Eurobarometer, please consult the full report.

¹ https://europa.eu/european-union/topics/research-innovation_en

² https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

³ https://data.europa.eu/data/datasets/s448_63_1_ebs225?locale=en

⁴ https://data.europa.eu/data/datasets/s806_73_1_ebs340?locale=en

⁵ https://data.europa.eu/data/datasets/s1096_79_2_401?locale=en

⁶ This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo declaration of independence.

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Note: In this report, countries are referred to by their official abbreviation:

| | | | |
|--|-----|--------------------|-------------------|
| Belgium | BE | Lithuania | LT |
| Bulgaria | BG | Luxembourg | LU |
| Czechia | CZ | Hungary | HU |
| Denmark | DK | Malta | MT |
| Germany | DE | Netherlands | NL |
| Estonia | EE | Austria | AT |
| Ireland | IE | Poland | PL |
| Greece | EL | Portugal | PT |
| Spain | ES | Romania | RO |
| France | FR | Slovenia | SI |
| Croatia | HR | Slovakia | SK |
| Italy | IT | Finland | FI |
| Republic of Cyprus | CY* | Sweden | SE |
| Latvia | LV | | |
| Albania | AL | Turkey | TR |
| Montenegro | ME | Serbia | RS |
| North Macedonia | MK | | |
| Bosnia and Herzegovina | BA | Norway | NO |
| Iceland | IS | Switzerland | CH |
| Kosovo | XK | The United Kingdom | UK |
| European Union - weighted average for the 27 Member States of the European Union | | | EU27 |
| BE, FR, IT, LU, DE, AT, ES, PT, IE, NL, FI, EL, EE, SI, CY, MT, SK, LV, LT | | | Euro area |
| BG, CZ, DK, HR, HU, PL, RO, SE | | | Outside euro area |

We would like to thank all the respondents across Europe who took their time to take part in this survey.

Without their active participation, this survey would not have been possible.

* Cyprus as a whole is one of the 27 Member States of the European Union. However, the 'Community *acquis*' is suspended in the part of the country not controlled by the Government of the Republic of Cyprus. For practical reasons, only interviews carried out in the part of the country controlled by the Government of the Republic of Cyprus are included in the category 'CY' and in the average of the EU27.

KEY FINDINGS



Knowledge about science and technology

The following results refer to EU27 countries:

- Interest in scientific and technological issues is high, with 42% of respondents very interested and 47% moderately interested in environmental problems including climate change, 38% very interested and 48% moderately interested in new medical discoveries, and 33% very interested and 49% moderately interested in new scientific discoveries and technological developments. There is higher interest in these issues than the non-scientific areas of culture and arts, politics, and sports news.
- Since 2010, the proportions of respondents who say they are “very interested” in the areas relating to science and technology have increased: new medical discoveries (+6 pp), environmental problems including climate change (+5 pp), and new scientific discoveries and technological developments (+3 pp).
- While citizens have high levels of interest in science and technology, they do not feel quite so well informed: just 21% of respondents say they are very informed about environmental problems including climate change and 61% say they are moderately informed. When it comes to new medical discoveries, 13% say they are very informed and 54% moderately well informed. For new scientific discoveries and technological developments the figures are similar: 13% very well informed and 53% moderately well informed.
- Since 2010 there have been small increases in the proportions of respondents who say they are “very well informed” about areas relating to science and technology: new medical discoveries (+2 percentage points), new scientific discoveries and technological developments (+2 pp) and environmental problems (+2 pp), with small drops in the proportions who say they are “poorly informed” about new medical discoveries (-2 pp) and environmental problems (-3 pp) and a somewhat larger drop in relation to new scientific discoveries (-5 pp).
- While interest and knowledge about science and technology are high, the topics may still seem out of respondents' reach or even of little relevance: while 54% agree that they would like to learn more about scientific developments, 46% of respondents agree that science is so complicated that they do not understand much about it (28% disagree) and 33% agree that in their daily life it is not important to know about science (46% disagree).
- Television (63%) is the preferred means to obtain information about developments in science and technology, followed far behind by online social networks and blogs (29%), and online and printed newspapers (24%).
- Respondents were also presented with statements on scientific issues, which they were asked to identify as either true or false; these tested different areas of knowledge relating to natural history and geography, the natural and physical sciences, as well as beliefs in conspiracy theories.

- In terms of natural history and geography, a clear majority of respondents (82%) knows that the continents on which we live have been moving for millions of years and will continue to move in the future, and that human beings as we know them today developed from earlier species of animals (67%). Most also say that it is false that the earliest humans lived at the same time as the dinosaurs (66%). Fewer are able to say that it is false that the world's human population is currently more than ten billion (43%).
- When it comes to citizens' knowledge of the natural and physical sciences, 82% of respondents know that the oxygen we breathe comes from plants, and 65% know it is false that climate change is for the most part caused by natural cycles rather than human activities. While a majority of respondents know that it is false that antibiotics kill viruses as well as bacteria (55%), fewer know that lasers do not work by focusing sound waves (42%). Just under half (47%) say that it is true that the methods used by the natural sciences and the social sciences are equally scientific (47%).
- When it comes to conspiracy theories, a majority know that it is false that viruses have been produced in government laboratories to control our freedom (55%) or that the cure for cancer exists but is hidden from the public by commercial interests (56%).

Views on the impacts of science and technology

- The most influential characteristics in determining the status of a country or group of countries are considered to be economic strength (51%), living and working conditions and well-being (35%), social, health and welfare services (25%), the rule of law (21%), and scientific and technological advancement (18%).
- Almost nine in ten (86%) respondents think the overall influence of science and technology on society is positive, an increase of nine percentage points since 2013. More than seven in ten respondents in every country think the influence is positive.
- Respondents are most likely to think that solar energy (92%), wind energy (87%), vaccines and combatting infectious diseases (86%), and information and communication technology (82%) will have a positive effect on our way of life in the next 20 years.
- Almost half of all respondents think health and medical care (47%) will be most affected by research and innovation in the coming years, while 40% think it will be the fight against climate change, and 32% the energy supply.
- Only a minority (25%) agree that science and technology do not really benefit people like them.
- More than half (57%) agree that science and technology could improve everyone's lives, but mostly improve the lives of people who are already better off; the majority of respondents in every EU27 country agrees with this statement.
- Seven in ten (70%) respondents agree that science and technology could improve living conditions in less developed countries, but mostly improve living conditions in well-off countries; the majority in every country agrees.

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- Almost two-thirds (65%) of respondents agree that science and technology could help improve the environment, but mostly help companies make money; the majority in every Member State also agrees.
- Opinion is divided on whether science and technology can sort out any problem: 38% agree, 35% disagree and 25% neither agree nor disagree. However, agreement has increased 16 percentage points since 2010 and has gone from being a minority to the majority view.
- Only a minority (25%) of respondents agree that thanks to scientific and technological advances, the Earth's natural resources will be inexhaustible. However, this is a five percentage point increase since 2010.
- More than half (56%) agree that new inventions will always be found to counteract any harmful consequences of scientific and technological development, an increase of five percentage points since 2010.
- Fewer than three in ten (29%) respondents agree that artificial intelligence and automation will create more jobs than they will eliminate.
- Across the EU almost seven in ten (69%) agree that science and technology make our lives easier, healthier and more comfortable, while 57% agree science and technology make our lives healthier – an increase of seven percentage points since 2013.
- The majority of respondents in the EU agree that science makes our ways of life change too fast (57%), and that the applications of science and technology can threaten human rights (52%).
- A minority (32%) of respondents in the EU agree that we depend too much on science and not enough on faith, a decline of seven percentage points since 2013.

Views on the governance of science and technology

- Just over half (52%) of respondents agree that we have no option but to trust those governing science and technology.
- Opinion is divided over the regulation of science and technology. Half (50%) of respondents think that science and technology should be tightly regulated by the government, while almost as many (48%) think it should be allowed to operate freely in the marketplace like a business.
- There is also no clear consensus amongst respondents about whether there should be no limit to what science is allowed to investigate – 41% agree but almost as many (38%) disagree.
- Respondents are more likely to agree that decisions about science and technology should be based primarily on the moral and ethical issues concerned (55%) than to say these decisions should be based primarily on the potential to make new scientific discoveries and develop new technologies (43%).
- Almost eight in ten (79%) respondents agree that the results of publicly funded research should be made available online free of charge; more than six in ten respondents in every Member State agrees.

Views of scientists

- Respondents have a mostly positive view of scientists, with 89% saying that “intelligent” describes scientists well. 68% say the same of “reliable”, 66% of “collaborative”, 58% of “honest”, and 47% that scientists ‘know what is good for people’. Fewer respondents see scientists as “bad at communicating” (39%), “arrogant” (28%), “narrow minded” (23%), or “immoral” (16%).
- Asked what qualities they want to see most in scientists, respondents mention intelligence (50%), honesty (43%), reliability (39%), morality (34%) and the ability to work together (27%). Qualities like communication skills (16%), altruism (12%) and modesty (8%) are less frequently mentioned.
- Respondents tend to agree that scientists should intervene in political debate to ensure that decisions take into account scientific evidence (68%), with fewer agreeing with the opposite statement that scientists should not intervene in political debate when decisions ignore scientific evidence (39%).
- Most respondents (50%) agree that we can no longer trust scientists to tell the truth about controversial scientific and technological issues because they depend more and more on money from industry (21% disagree).
- Most respondents (51%) disagree that scientists spend sufficient time meeting people like them to explain their work, with 23% agreeing.

Citizens' engagement in science and technology

- Looking at respondents' involvement in science and technology, most (52%) feel that decisions about science and technology should be made by scientists, engineers and politicians, but that the public should always be informed. About a third think that the public should be consulted and public opinion should be seriously considered (32%). Fewer think that the public does not need to be involved in decisions about science and technology (7%) or that public opinion should be the main concern when making decisions about science and technology (8%).
- Most respondents (72%) think that decisions about science and technology should be based mainly on the advice of experts.
- Most respondents agree (61%) that involving non-scientists in research and technological development ensures that science and technology respond to the needs, values and expectations of society.
- Asked about the people and organisations that are best qualified to explain the impact of scientific and technological developments on society, scientists working at public (61%) and private organisations (40%) are most cited, followed by general practitioners and specialist doctors (29%).
- Respondents were also asked how they engaged with science and technology. Respondents cite watching documentaries (59%), talking about science and technology issues with family or friends (55%), visiting science and technology museums (33%), and studying science and technology-related issues in their free time (22%) the most frequently.

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- Asked why they may sometimes find it difficult to engage with science and technology, respondents most frequently mention lack of time (41%), lack of knowledge in the field of science and technology (39%), and lack of interest (34%).

Young people, gender equality, and social responsibility in science and technology

- Science is considered important for young people, with 61% of respondents agreeing that science prepares the younger generation to act as well-informed citizens. In addition, 69% of respondents think that thanks to science and technology, there will be more opportunities for future generations.
- Gender equality is considered important, with 76% of respondents agreeing that promoting gender equality is important for them personally. Respondents also agree that gender equality in the science and technology workforce would help ensure we live in a fairer and more equal society (73%) and that gender equality in the science and technology workforce would improve the outcomes of science and technology (65%). Moreover, a majority agrees that gender equality in the science and technology workforce would improve business profits and the economy (58%).
- Social responsibility is considered important for science and technology, with 78% of respondents agreeing that science and technology should consider the needs of all groups of people when developing new solutions and products. Respondents also think that the government should take responsibility to ensure that new technologies benefit everyone (72%). Almost the same proportion (79%) think that the government should make private companies tackle climate change.

Comparative advantage of the EU in science

- Seven in ten (70%) respondents think we should cooperate enthusiastically with the rest of the world and not isolate ourselves, while 29% think that our lives are threatened by organised crime and terrorism, from which we urgently need to protect ourselves. The majority in every Member State considers cooperating enthusiastically with the rest of the world - not isolating ourselves - is closest to their point of view.
- The majority of respondents think researchers in China (58%), the United States (57%), and Japan (54%) are ahead of researchers in the EU in making scientific discoveries. Three in ten (30%) say this is true for researchers in South Korea, 16% say researchers in their own country are ahead of those in the EU, and 13% think researchers in India are ahead of those in the EU.

I. KNOWLEDGE ABOUT SCIENCE AND TECHNOLOGY

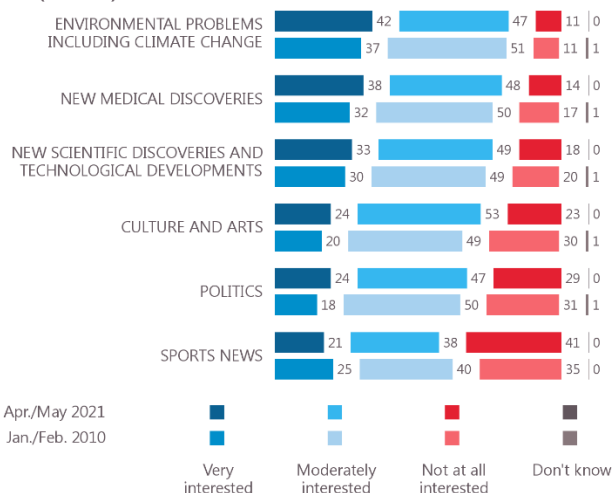


1. Interest in - and awareness of - science and technology

This summary report begins with an examination of how interested and well informed respondents are about science and technology. It then focuses on respondents' attitudes towards science and technology, the most used sources of information about scientific and technological developments, and explores respondents' actual knowledge and understanding of a range of scientific issues.

Within the EU, **interest** is widespread in areas relating to science and technology. Around nine in ten respondents (89%) say they are interested (either "very interested" or "moderately interested") in environmental problems, including climate change, with a similar proportion (86%) interested in new medical discoveries, and just over eight in ten (82%) interested in new scientific discoveries and technological developments. EU citizens are most likely to be "very interested" in environmental problems (42%) and new medical discoveries (38%), with a smaller proportion (33%) saying they are "very interested" in new scientific discoveries.

QA2 In everyday life, we have to deal with many different issues, where we feel more or less interested. For each of the following, please indicate whether you are... (% - EU27)



In terms of the other spheres of activity covered, more than seven in ten respondents say they are interested in culture and the arts (77%) and politics (71%), with around one in four (24%) "very interested" in each. Respondents are least likely to say that they are interested in sports news; around six in ten (59%) say they are interested, with 21% saying they are "very interested".

A similar set of questions was included in a 2010 Eurobarometer Survey (Special Eurobarometer 340). Since then, the proportions of respondents who say they are "very interested" in the areas relating to science and technology have increased: new medical discoveries (+6 pp), new scientific discoveries and technological developments (+3 pp) and environmental problems (+5 pp), with small drops in the proportions who say they are "not at all interested" in new medical discoveries (-3 pp) and new scientific discoveries (-2 pp). In relation to other spheres of activity, there have been increases in the proportion of respondents saying they

are "very interested" in politics (+6 pp) – with a small drop in the proportion "not at all interested" (-2 pp); and "very interested" in culture and the arts (+4 pp) – with a drop in the proportion "not at all interested" (-7 pp). By contrast, there has been a drop in the proportion of respondents who are "very interested" in sports news (-4 pp) and an increase in the proportion that is "not at all interested" (+6 pp).

Focusing in this summary report on the current survey results and interest in **new scientific discoveries and technological developments**, there is considerable variation between EU Member States. The proportion of respondents who say they are "very interested" in new scientific discoveries and technological developments ranges from 11% in Bulgaria to 61% in Cyprus and 62% in Portugal, compared with the EU average of 33%. In addition to Portugal and Cyprus, a majority of respondents say they are "very interested" in new scientific discoveries and technological developments in Ireland and Belgium (54% in each) and Luxembourg (51%). There are only four EU Member States where more than one in four people say they are "not at all interested" in new scientific discoveries and technological developments: Poland (37%), Bulgaria (33%), Italy (31%) and Romania (28%). This compares with an EU average of 18%.

Among the non-EU countries surveyed, people are most likely to be "very interested" in new scientific discoveries and technological developments in Switzerland (49%), the UK (48%) and Turkey (46%); they are least likely to say they are "very interested" in Albania (7%), Serbia (11%), Montenegro (14%) and Bosnia and Herzegovina (17%). Respondents in Serbia (39%) are the most likely to say they are "not at all interested" in new scientific discoveries and technological developments, followed by those in Albania and North Macedonia (both 29%).

Comparing the current results with those reported in 2010, there are 18 EU Member States where the proportion of respondents saying they are "very interested" in new scientific and technological developments has increased, with Portugal, showing a particularly large increase (+48 pp). The most notable shifts elsewhere are in Ireland (+27 pp), Belgium (+22 pp), Czechia (+21 pp), Estonia (+14 pp) and Spain (+12 pp), while Hungary shows the most notable drop in the proportion saying they are "very interested" (-9 pp).

Among the non-EU countries surveyed, Turkey shows a particularly large increase in the proportion of respondents saying they are "very interested" in new scientific and technological developments (+30 pp), with Switzerland also showing a notable increase (+16 pp).

Looking at differences between socio-demographic groups⁷, and focusing on **new medical discoveries** and **new scientific and technological developments**, some consistent patterns emerge in terms of the sub-groups that are particularly likely to say they are "very interested".

⁷ Note that throughout the report socio-demographic and key variable findings are based on the EU 27 Member States.

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Sub-groups that are particularly likely to be “very interested” in each of the three areas include:

People who finished full-time education aged 20 or over, particularly when compared with those leaving full-time education aged 15 or under. The largest differences are in relation to new scientific discoveries and technological developments (44% of those who finished full-time education aged 20 or over are “very interested”, compared with 18% of those who finished aged 15 or under);

Managers, when compared with all other occupational groups, most notably in relation to new scientific discoveries and technological developments (47% of managers are “very interested”, compared with the housepersons – 24%);

People who say they ‘never’ or ‘almost never’ have difficulties paying their household bills, particularly when compared with those who have difficulties paying their household bills ‘from time to time’. The largest differences are in relation to new scientific discoveries and technological developments (36% of those who ‘never’ or ‘almost never’ have difficulties are “very interested”, compared with 22% of those who have difficulties ‘from time to time’);

People who use the internet every day, particularly when compared with those who never use it. Again, the differences are larger in relation to new scientific discoveries and technological developments (37% of everyday users, compared with 13% of non-users) than for new medical discoveries;

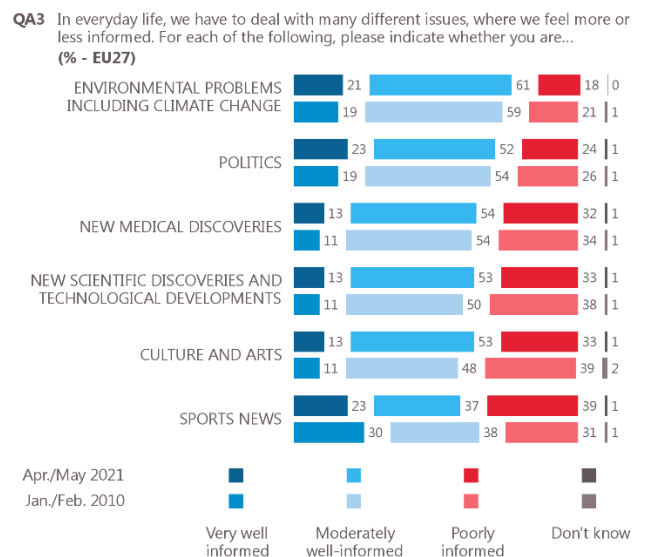
In terms of gender and age, on the other hand, there are no consistent patterns. Men (40%) are much more likely than women (26%) to say they are “very interested” in new scientific discoveries and technological developments, while women (40%) are slightly more likely than men (36%) to be “very interested” in new medical discoveries. Similarly, while the proportion of people “very interested” in new scientific discoveries and technological developments declines with age, ranging from 38% among 15-24 year olds to 29% among those aged 55 or over, the opposite is true for new medical discoveries, where the proportion of “very interested” ranges from 30% among 15-24 year olds to 41% among those aged 55 or over.

In terms of the key variable groups, there are strong and unsurprising relationships between people saying they are “very interested” in these two areas and other variables that indicate engagement or involvement with the world of science and technology. Hence, sub-groups particularly likely to say they are “very interested” in each of the two areas include: those who have, or had in the past, a professional association with research, science and innovative technology development, either through their own work or the work of a family member; people who believe that science and technology has a positive influence on society; and people who achieve high scores on the ‘science quiz’ questions. In addition, there is a strong positive association between the two topics, where interest in one of the two topics asked about is often connected to interest in the other topic.

Respondents were then asked **how well informed** they felt they were about six areas of interest.

Within the EU, a majority of people say they feel well informed (either “very well” or “moderately well”) about each of the areas of interest. People are most likely to say they feel well informed about environmental problems including climate change (82%), followed by politics (75%). Two-thirds of respondents say they are well informed about new medical discoveries (67%), new scientific discoveries and technological developments (66%), and culture and the arts (66%). A slightly lower proportion (60%) say they are well informed about sports news.

More than one in five EU citizens say they are “very well informed” about politics (23%), sports news (23%) and environmental problems (21%). Somewhat smaller proportions – 13% in each case – say they are “very well informed” about new medical discoveries, new scientific discoveries and technological developments, and culture and the arts.



A similar measure was included in an earlier Eurobarometer Survey (Special Eurobarometer 340 EB 73.1) conducted in 2010. Since then, there have been small increases in the proportions of respondents who say they are “very well informed” about areas relating to science and technology: new medical discoveries (+2 pp), new scientific discoveries and technological developments (+2 pp) and environmental problems (+2 pp), with small drops in the proportion who say they are “poorly informed” about new medical discoveries (-2 pp) and environmental problems (-3 pp), and a somewhat larger drop in relation to new scientific discoveries (-5 pp).

Regarding the other spheres of activity, there have been increases in the proportion of respondents saying they are “very well informed” about politics (+4 pp) – with a small drop in the proportion who say they are “poorly informed” (-2 pp). There has also been an increase in the number of respondents who say they are “very well informed” about culture and the arts (+2 pp) – with a drop in the proportion who feel they are “poorly informed” (-6 pp). There has been a drop in the proportion of respondents who feel “very informed” about sports news (-7 pp) and an increase in the proportion who say they are “poorly informed” (+8 pp).

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Focusing on **new scientific discoveries and technological developments**, respondents in Denmark (20%), and those in Luxembourg and Spain (both 19%), are most likely to say they are “very well informed”, compared with the EU average of 13%; those in Bulgaria (4%), and Latvia, Greece, and Italy (6% in each) are the least likely to feel “very well informed”. The EU Member States where respondents are most likely to say they are “poorly informed” are Hungary and Bulgaria (both 53%), Italy (50%) and Greece (48%). This compares with an EU average of 33%.

Among the non-EU countries surveyed, the proportion of respondents who say they are “very well informed” about new scientific discoveries and technological developments ranges from just 5% in Serbia to 20% in Kosovo. Respondents in Serbia (57%) are particularly likely to say they are “poorly informed” about new scientific discoveries and technological developments.

Comparing the current results compared with those reported in 2010, there are 15 EU Member States where the proportion of respondents who say they feel “very well informed” about new scientific discoveries and technological developments has increased, with the most notable shifts in Spain (+12 pp), Czechia (+8 pp), and Belgium, Denmark, Austria and Portugal (+7 pp in each). Among the nine EU Member States where the proportion who say they feel “very well informed” has dropped, the most notable change is in Luxembourg (-5 pp).

Among the non-EU countries surveyed, the most notable change is again in Turkey where the proportion of respondents saying they feel “very well informed” about new scientific discoveries and technological discoveries has increased (+14 pp).

Looking at differences between socio-demographic groups for **new medical discoveries** and **new scientific and technological developments**, some consistent patterns emerge in terms of the sub-groups that are particularly likely to say they are “very well informed” in both of the areas.

The differences largely reflect those seen in relation to “interest” (see above) in the same three areas, with the sub-groups particularly likely to say they are “very well informed” about each of the three areas being:

People who finished full-time education aged 20 or over, particularly when compared with those leaving full-time education aged 15 or under. The largest differences are in relation to new scientific discoveries and technological developments (18% of those finishing aged 20 or over say they are “very well informed”, compared with 6% of those aged 15 or under);

Managers, particularly when compared with housepersons, most notably in relation to new scientific discoveries and technological developments (20% of managers say they are “very well informed”, compared with 6% of housepersons);

People who say they ‘never’ or ‘almost never’ have difficulties paying their household bills, when compared with those who have difficulties paying their bills either ‘most of the time’ or ‘from time to time’. The differences are somewhat smaller than for the other socio-demographic variables highlighted here;

People who use the internet every day, particularly when compared to those who never use it, with relatively large differences across all three measures: 14% whose use the internet everyday vs 7% who never use it in relation to new medical discoveries; and 14% of everyday users vs 5% who never use the internet for new scientific discoveries and technological developments;

In terms of gender, the pattern of responses is less consistent. Men (18%) are twice as likely as women (9%) to say they are “very well informed” about new scientific discoveries and technological developments, while similar proportions (13% of men and 12% of women) say they are “very well informed” about new medical discoveries. Differences by age group across the three topics are relatively small.

In terms of the key variable groups, there are again strong and unsurprising relationships between people saying they are “very well informed” in the two areas and other variables that indicate engagement or involvement with the world of science and technology. Hence, sub-groups particularly likely to say they are “very well informed” in each of the two areas include: those who say they are very interested in the topic; those who say they are very interested in one of the other two science-related topics asked about; and those who have, or did have in the past, a professional association with research, science and innovative technology development, either through their own work or the work of a family member.

The proportions of people who say they are “very well informed” about the two topics does not vary much according to whether they regard science and technology as having a positive or negative influence on society. However, those who think science and technology has a negative influence on society are much more likely than those who say it has a positive influence to say they are “poorly informed” about each of the topics (43% vs 30% in relation to new medical discoveries and 46% vs 31% for new scientific discoveries and technological developments).

2. Attitudes towards science

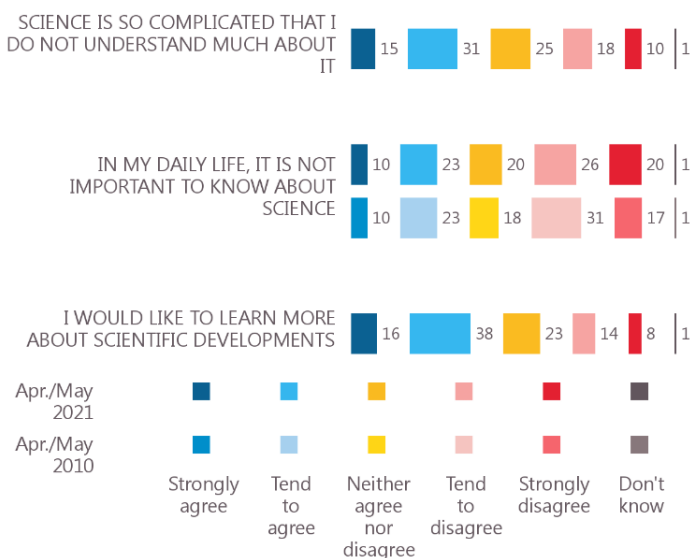
Respondents were asked how much they agreed or disagreed with a series of nine statements about science and technology. The three statements covered in this summary report chapter are:

- “Science is so complicated that I do not understand much about it”;
- “I would like to learn more about scientific developments in places like town halls, museums and libraries”;
- “In my daily life, it is not important to know about science”.

Just under half of respondents (46%) – agree that ‘science is so complicated that they don’t understand much about it’, with one in seven (15%) saying that they “strongly agree”. Just under three in ten respondents (28%) disagree, with one in ten (10%) saying that they “strongly disagree”. One in four respondents (25%) neither agree nor disagree with the statement.

Just over half of respondents (54%) agree that they would ‘like to learn more about scientific developments in places like town halls, museums and libraries’, with around one in six (16%) saying that they “strongly agree”. Just over one in five respondents (22%) disagree that they would like to learn more, with a small minority (8%) saying they “strongly disagree”. Just under one in four respondents (23%) say that they neither agree nor disagree.

QA9 The following are some statements that people have made about science or technology. For each statement, please indicate to what extent you agree or disagree.
 (% - EU)



Respondents are least likely to agree that it is ‘not important in their daily lives to know about science’. One-third of respondents (33%) agree that it is not important, with one in ten (10%) saying that they “strongly agree”. Just under half of all respondents (46%) disagree with the statement, with one in five (20%) saying they “strongly disagree”. One in five respondents (20%) are neutral.

Attitudes towards these statements vary considerably both within the EU and among the non-EU countries surveyed.

For the statement “I would like to learn more about scientific developments in places like town halls, museums and libraries”, respondents in Portugal are most likely to agree (80%) with the statement, considerably higher than the EU average of 54%. The next highest levels of agreement are found in Ireland (68%), Luxembourg (65%) and Cyprus (64%). More than a third of respondents in Portugal (36%) and Cyprus (37%) say they “strongly agree” that they would like to learn more about scientific developments. The lowest levels of agreement on this measure are seen in Bulgaria, Austria and Croatia (41% in each), Slovakia (42%) and Denmark (43%).

Among the non-EU countries surveyed, a notably high proportion of respondents in Turkey (84%) agree that they would like to learn more about scientific developments in places like town halls, museums and libraries, with close to half (46%) saying that they “strongly agree”. Respondents in Albania (24%) and Serbia (30%) are least likely to agree.

Respondents in Bulgaria (70%), Cyprus (69%), Greece (67%) and Spain (61%) are particularly likely to agree that “science is so complicated that they do not understand much about it”, when compared with the EU average of 46%. A majority of respondents agree with the statement in a further nine EU countries. Respondents in Belgium (23%), Ireland (24%) and the Netherlands (25%) are the least likely to agree that science is so complicated that they do not understand much about it. There are five EU Member States where at least one in four respondents “strongly agree” that they do not understand much about science (compared with the EU average of 15%): Bulgaria (36%), Cyprus (31%), Greece (27%), Spain (26%) and Malta (25%).

Among the non-EU countries surveyed, the proportion of respondents who agree that science is so complicated that they do not understand much about it is highest in Kosovo (60%), and Montenegro and Serbia (both 59%), and lowest in Albania (24%) and Iceland (26%).

Attitudes across the EU Member States again vary considerably in relation to the statement “In my daily life it is not important to know about science”. There are three EU Member States where the majority of respondents agree that it is not important for them to know about science in their daily lives: Bulgaria (57%) and Greece and Austria (both 53%), compared with the EU average of 33%. The lowest proportions are in Czechia and Finland (both 16%), followed by Latvia, Portugal and Malta (18% in each).

Among the non-EU countries surveyed, a majority of respondents agree that it is not important for them to know about science in their daily lives in Montenegro and Serbia (both 54%). The non-EU countries where the lowest proportion of respondents agree with this statement are Switzerland (19%) and Albania (20%).

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Since 2010 (Special Eurobarometer 340 EB 73.1), there has been no change at the EU27 level in the proportions of respondents who say they “strongly agree” or “tend to agree” that it is not important for them to know about science in their daily lives. Comparing the current national level results with those reported in 2010, there are ten EU Member States where the proportion of respondents who agree that it is not important for them to know about science in their daily lives has increased, with the most notable shifts in Poland and Romania (both +15 pp), Bulgaria and Hungary (both +12 pp) and Greece and Italy (both +8 pp). There are 17 EU Member States where the proportion who agree that it is not important for them to know about science has dropped, with the most notable decreases in Portugal (-26 pp), Czechia and Estonia (both -22 pp), Belgium and Luxembourg (both -18 pp), Ireland and Finland (both -14 pp) and Latvia (-13 pp).

Among the non-EU countries surveyed, the most notable change is in Switzerland, with a marked drop in the proportion of respondents who agree that it is not important for them to know about science in their daily lives (-12 pp).

Looking at differences between socio-demographic groups across these three statements, some consistent patterns emerge. Broadly speaking, groups more likely to agree with the statement “I would like to learn more about scientific developments in places like town halls, museums and libraries” are less likely to agree with the two other statements (“Science is so complicated that I do not understand much about it” and “In my daily life, it is not important to know about science”). This is the case for the following groups:

- Younger people, when compared with those aged 55 and over:

“I would like to learn more about scientific developments in places like town halls, museums and libraries” – 15-24 (61% agree), 25-39 (59%), 40-54 (56%), 55+ (48%);

“Science is so complicated that I do not understand much about it” – 15-24 (39% agree), 25-39 (40%), 40-54 (42%), 55+ (55%);

“In my daily life, it is not important to know about science” – 15-24 (25% agree), 25-39 (31%), 40-54 (31%), 55+ (40%).

- People who finished their full-time education aged 20 or over, particularly when compared with those leaving full-time education aged 15 or under:

“I would like to learn more about scientific developments in places like town halls, museums and libraries” (60% vs 39% agree);

“Science is so complicated that I do not understand much about it” (31% vs 71% agree);

“In my daily life, it is not important to know about science” (24% vs 51% agree).

- Managers and students, when compared with other occupational groups:

“I would like to learn more about scientific developments in places like town halls, museums and libraries” (60% of managers and 65% of students agree, compared with 46% of housepersons);

“Science is so complicated that I do not understand much about it” (26% of managers and 35% of students agree, compared with 55% of unemployed people and 57% of those who are retired),

“In my daily life, it is not important to know about science” (20% of managers and 22% of students agree, compared with 42% of respondents who are retired).

- People who use the internet every day, particularly when compared with those who never use it:

“I would like to learn more about scientific developments in places like town halls, museums and libraries” (58% vs 34% agree);

“Science is so complicated that I do not understand much about it” (43% vs 67% agree);

“In my daily life, it is not important to know about science” (30% vs 55% agree).

- People who say they ‘never’ or ‘almost never’ have difficulties paying their household bills, compared with those who do have difficulties, though the differences are small in relation to learning more about scientific developments:

“I would like to learn more about scientific developments in places like town halls, museums and libraries” – ‘never’ or ‘almost never’ (55% agree), ‘from time to time’ (54%), ‘most of the time’ (51%);

“Science is so complicated that I do not understand much about it” – ‘never’ or ‘almost never’ (42% agree), ‘from time to time’ (56%), ‘most of the time’ (62%);

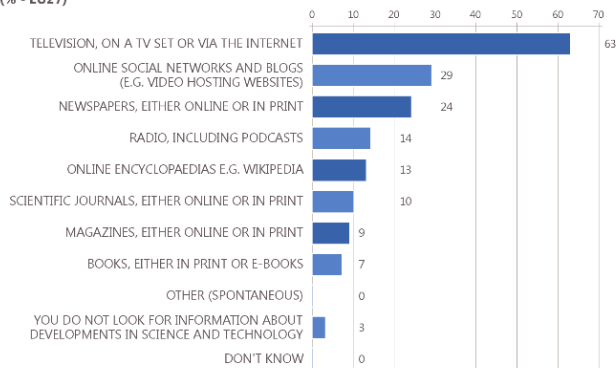
“In my daily life, it is not important to know about science” – ‘never/almost never’ (30% agree), ‘from time to time’ (41%), ‘most of the time’ (44%).

3. Sources of information about scientific and technological developments

This section looks at the **sources of information** people use to find out about developments in science and technology. Respondents were presented with a list of different sources of information that may be used to find out about developments in science and technology and asked to choose the two main sources that they use.

Within EU Member States, television, either via a TV set or via the internet, is by far the most widely used source. Almost two-thirds of respondents (63%) say that this is one of their two main sources of information. Around three in ten respondents (29%) use online social networks and blogs as a main source of information, and around a quarter (24%) use online or printed newspapers. Much smaller proportions say that they use radio, including podcasts (14%), online encyclopaedias (13%), and online or printed scientific journals (10%).

QA4a Of the following list of sources of information about developments in science and technology, please choose the two main sources that you use (watch, read, or listen) the most. (MAX. 2 ANSWERS) (% - EU27)



Less than one in ten respondents use the other sources that were listed as one of their two main methods for finding information about science and technology.

Television is the most widely cited source of information used in all EU Member States, with at least seven in ten respondents saying it is one of their two main sources in Romania (74%), Italy, Hungary, and Portugal (71% in each), and Slovenia (70%), compared with the EU average of 63%. The EU countries where respondents are least likely to mention television as a main source of information about developments in science and technology are Finland (48%), Luxembourg (51%), Ireland (52%), and Greece and Austria (both 53%).

Among the non-EU countries surveyed, respondents are most likely to mention television as a main source of information about developments in science and technology in Bosnia and Herzegovina (76%), North Macedonia (72%) and Kosovo (71%), and least likely to do so in Albania (46%).

Using *online social networks and blogs* is the second or third most widely mentioned main source of information in all EU Member States except Finland. In Finland it ranks fifth (behind television, newspapers, scientific journals, and online encyclopaedias), with

only 17% of respondents – lower than any other EU country and compared with the EU average of 29% – saying they use social networks and blogs as a main source of information. Notably high proportions of respondents (compared with the EU average of 29%) say that they use social networks and blogs in Cyprus (53%), Greece (50%), Lithuania (46%) and Malta (44%).

Among the non-EU countries surveyed, notably high proportions of respondents use social networks and blogs in Kosovo (48%), North Macedonia (42%), Montenegro (41%) and Bosnia and Herzegovina (40%). The countries where respondents are least likely to say that they use social networks and blogs are Switzerland (19%), where this source ranks fourth behind television, newspapers and radio; and Norway (18%), ranking fourth behind television, newspapers and scientific journals.

Among EU countries, the proportion of respondents mentioning *newspapers* (either online or in print) is highest in the Netherlands (51%), Belgium (45%), Denmark (44%), Sweden (43%), Finland and Ireland (both 42%) and Luxembourg (41%), compared with the EU average of 24%. It is lowest in Romania (7%) and Hungary (10%).

Among the non-EU countries surveyed, people in Norway (54%) and Switzerland (51%) are particularly likely to use newspapers as a main source of information, while those in North Macedonia (4%), Kosovo (7%) and Albania (10%) are least likely to do so.

Within the EU, use of the *radio, including podcasts*, is most widespread in Ireland (30%), France (22%), Czechia (21%) and Slovakia (20%) – compared with the EU average of 14%. It is least widely mentioned by respondents in Greece and Italy (both 5%) and Finland (6%). Within non-EU countries, radio is most widely mentioned in Iceland (23%), the UK and Switzerland (both 20%), and least widely mentioned in Kosovo (3%), Montenegro (4%), and North Macedonia and Serbia (both 5%).

The proportion of respondents in EU countries using *online encyclopaedias* as one of their two main sources of information ranges from a high of 26% in Finland, followed by Greece and Latvia (both 24%) to a low of 5% reported in Spain and Portugal; this compares with an EU average of 13%. In non-EU countries, the proportions range from 16% in Iceland and Switzerland to 6% in Kosovo;

EU Member States with a notably high proportion of respondents using *scientific journals* as one of their two main sources for information include Finland (28%), Portugal (22%) and Estonia (20%), with the lowest proportion in Bulgaria (3%); this compares with an EU average of 10%. In non-EU countries, proportions range from a high of 20% in Norway to a low of 5% in North Macedonia.

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European citizens' knowledge and attitudes towards science and technology

There are some notable differences between socio-demographic groups in terms of the sources of information people use the most to find out about developments in science and technology.

Gender is not a key differentiator in this respect. The only notable difference between men and women in terms of the sources they use the most relates to scientific journals, which men (12%) are more likely than women (8%) to mention as one of the sources that they use the most.

Age, by contrast, has a strong relationship on the sources of information people use. This is not surprising given that internet usage in general varies considerably by age. Within the EU, the proportion of respondents in this survey who say they use the internet daily decreases as age increases – over 90% of people aged under 55 say they use the internet every day, rising to 99% of those aged 15-24 and 98% of 25-34s. Usage then decreases rapidly, falling to 80% among 55-64s, 62% among 65-74s and 34% among those aged 75 and over.

These differences are reflected in the sources people use to learn about developments in science and technology. Use of online social networks and blogs also varies considerably by age: the proportion of respondents who mention these as one of their main sources of information range from 57% of 15-24 year olds to 10% of 65-74 year olds and just 4% of those aged 75 and over. Among 15-24 year olds, social networks and blogs are the most widely mentioned source of information, followed by television. There is a similar (but less marked) pattern in relation to the use of online encyclopaedias, such as Wikipedia, with the proportion mentioning these as one of their main sources of information ranging from 19% of 15-24 year olds to 5% of those aged 75 and over.

Conversely, younger people – in particular those aged 15-24 – are much less likely than their older peers to use more traditional channels of information (whether online or not) such as television, newspapers, magazines, and radio. This is especially the case for newspapers – which 13% of 15-24 year olds mention as a main information source, compared with 24% of EU adults as a whole – and radio (7% and 14% respectively).

The survey results show that the proportion of respondents using more traditional channels of information increases with age. With the exception of 15-24 year olds, television is the most widely mentioned source among all age groups. However, social networks and blogs are the second most widely mentioned source among those aged 25-54, (with newspapers mentioned by a similar proportion of those aged 45-54). Among those aged 55 and over, however, television is particularly widely mentioned and newspapers are the second most commonly mentioned source of information. Radio is also a relatively important source of information among these older age groups.

In terms of occupational status, differences between students and those who are retired reflect those noted by age. Of note, students (18%), together with managers (19%), are particularly likely to mention scientific journals as one of the sources of information they use the most, relative to all other occupational groups. Managers are more likely than all other groups to mention newspapers, magazines, radio and scientific journals, while

housepersons are the group least likely to mention books, journals and, along with students, newspapers.

People who score highly in the 'science quiz' are particularly likely to mention online encyclopaedias (19% of those with more than eight correct answers vs 7% of those with less than 5 correct answers) and journals (17% vs 5%) as among the sources of information they use the most. Among the high-performing groups, only 54% mention television as one of sources they use the most, compared with 65% among those getting 5-8 correct answers and 69% among those getting less than five correct answers.

Finally, mention of books and scientific journals as a preferred source of information – again, as might be expected – is particularly high among people who themselves and/or via a family member, work or have worked in a scientific profession. For example, among the group where both the respondent and a family member have, or did have in the past, a professional association with this area, 15% mention books as one of the sources they use the most, compared with 7% among adults as a whole, and 32% mention journals, compared with 10% among adults as a whole.

4. Knowledge of natural history, demographics and geography

The remaining sections of this chapter explore people's actual knowledge and understanding of science in a broad sense. This was done via a 'quiz' format, where respondents were presented with a set of 11 statements – some factual and others non-factual – and asked to say whether they believed each statement to be true or false. The findings are reported in three broad topic areas: natural history, demographics and geography; the natural and physical sciences; and common conspiracy theories. The final section of this chapter summarises people's knowledge and understanding of scientific issues by looking at the number of correct answers that respondents gave.

Respondents were presented with four statements that relate to natural history, demographics and geography, and asked to say whether they believed them to be true or false. For each statement, respondents could also say they did not know if they were unsure of their answer⁸.

The four statements were:

- *"The earliest humans lived at the same time as the dinosaurs"* (FALSE);
- *"The continents on which we live have been moving for millions of years and will continue to move in the future"* (TRUE);
- *"The world's human population is currently more than 10 billion"* (FALSE)⁹;
- *"Human beings, as we know them today, developed from earlier species of animals"* (TRUE).

People are most likely to be able to correctly say that it is true that *"The continents on which we live have been moving for millions of years and will continue to move in the future"*. The large majority of respondents in the EU (82%) correctly identify this statement as true. Only 9% of respondents incorrectly say that it is false, and 9% unable to say if it is true or false.

Two-thirds of respondents (67%) correctly say that it is true that *"Human beings, as we know them today, developed from earlier species of animals"*. Just under one in four respondents (23%) incorrectly identify this as false, with one in ten respondents (10%) unable to say if this statement is true or false.

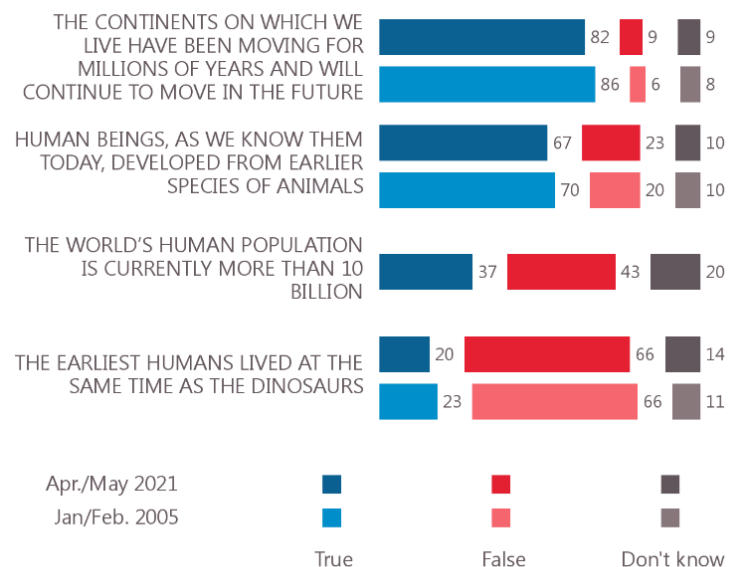
A similar proportion of respondents (66%) correctly say that it is false that *"The earliest humans lived at the same time as the dinosaurs"*. One in five respondents (20%) incorrectly identify it as true. One in seven respondents (14%) say they don't know whether the statement is true or false.

Respondents in the EU are less likely to know what the world's population is: just over two-fifths (43%) of respondents correctly say that it is false that *"The world's human population is currently more than 10 billion"*. A slightly smaller proportion (37%) of

respondents incorrectly identify it as true, with one in five (20%) unable to say if it is true or false.

Three of these questions were included in an earlier Eurobarometer Survey (Special Eurobarometer 224 EB 63.1) conducted in 2005. Since then, there has been a small drop in the proportions correctly saying that it is true that continents have been moving for millions of years and will continue to move in the future (-4 pp), and correctly saying that it is true that human beings developed from earlier species of animals (-3 pp). In relation to whether the earliest humans lived at the same time as the dinosaurs, there has been no change in the proportion correctly identifying this as false, though there has been a small drop in the proportion incorrectly thinking that it is true (-3 pp) and a corresponding increase in the proportion who don't know whether the statement is true or false (+3 pp).

QA20 Finally, for each of the following statements, please indicate whether you believe them to be true or false. If you don't know, you can just indicate so.
 (% - EU)



⁸ The "don't know" answer option was read out loud in face-to-face interviewing and immediately visible in online interviewing.

⁹ This item is new and was not asked in 2005.

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European citizens' knowledge and attitudes towards science and technology

Looking at the current survey results, in most EU Member States (22/27) the majority of respondents correctly say that it is false that *"The earliest humans lived at the same time as the dinosaurs"*¹⁰.

Respondents are most likely to correctly say that it is false that the earliest humans lived at the same time as the dinosaurs in Sweden (86%), Luxembourg, Czechia and Belgium (82% in each) and Germany (80%). This compares with the EU average of 66%. A minority of respondents correctly say this is false in Bulgaria (35%), Romania and Cyprus (both 45%) and Lithuania (49%). Around a third or more of respondents say they don't know whether the statement is true or false in Bulgaria (36%), Lithuania and Latvia (both 33%) and Cyprus (32%) – compared with the EU average of 14%.

Among the non-EU countries surveyed, the proportion of respondents who correctly say that it is false that the earliest humans lived at the same time as the dinosaurs is highest in Switzerland (80%), followed by Iceland (73%), with only a minority of respondents correct in Albania (26%), Kosovo (34%) and Turkey (42%). Kosovo has a notably high proportion (48%) of respondents unable to say if this statement is true or false.

Comparing the 2021 findings with those of 2005, there are 12 EU Member States where the proportion of respondents who correctly say that it is false that the earliest humans lived at the same time as the dinosaurs has increased, with the most notable shifts in Portugal (+18 pp), Spain (+15 pp), Ireland (+14 pp) and Belgium and Malta (both +12 pp). Among the 11 EU Member States where the proportion who correctly say this statement is false has dropped, the most notable decreases are in Slovenia (-14 percentage points), Hungary (-13 pp) and Bulgaria and Denmark (both -10 pp).

Among the non-EU countries surveyed, the most notable changes are in Turkey, where the proportion of respondents who correctly say that it is false that the earliest humans lived at the same time as the dinosaurs has increased (+12 pp); and in Norway, where the proportion who correctly say this statement is false has dropped (-10 pp).

Focusing on the current survey, in almost all EU Member States (24/27) the majority of respondents correctly say that it is true that *"Human beings, as we know them today, developed from earlier species of animals"*¹¹.

Respondents are most likely to correctly say that human beings developed from earlier species of animals in Ireland (84%), Sweden, Luxembourg and Denmark (83% in each) and Belgium (81%). This compares with the EU average of 67%. The exceptions, where only a minority correctly say that this is true are Slovakia (36%), Latvia (39%) and Greece and Cyprus (both 48%). Latvia has a markedly high proportion of respondents (28%) unable to say if this statement is true or false, along with Bulgaria (27%) and Lithuania (24%) – compared with the EU average of 10%.

Among the non-EU countries surveyed, respondents in Iceland (86%), and the UK and Norway (both 79%) are most likely to correctly say that it is true that human beings developed from earlier species of animals, while those in Kosovo (22%), Turkey (37%), Montenegro (40%), Bosnia and Herzegovina (40%), and Albania (49%) are the least likely. Kosovo has an exceptionally high proportion of respondents (48%) who don't know whether the statement is true or false.

Comparing the current survey findings with those of 2005, there are 14 EU Member States where the proportion of respondents correctly saying that it is true that human beings developed from earlier species of animals has increased, with the most notable changes in Ireland (+17 pp), Luxembourg (+15 pp), Portugal (+13 pp) and Malta and Austria (both +12 pp). Among the ten EU Member States where the proportion who correctly say this statement is true has dropped, Slovakia has a particularly large decline (-24 pp), followed by Slovenia (-12 pp) and Latvia (-10 pp).

Among the non-EU countries surveyed, the most notable changes are again in Turkey, along with Switzerland, where the proportion of respondents who give a correct answer has increased (+10 and +11 pp respectively).

Focusing on the current survey, there are 12 EU Member States where at least half of respondents correctly say it is false that *"The world's human population is currently more than 10 billion"*¹².

Respondents are most likely to correctly say that it is false that the world's population is more than 10 billion in Luxembourg (63%), Estonia (62%) and Czechia (60%), with the lowest proportions reported in Cyprus (24%), Bulgaria (27%), and Spain and Malta (both 28%). This compares with the EU average of 43%. A notably high proportion of respondents in Bulgaria (39%) and Malta (31%) don't know whether the statement is true or false, compared with the EU average of 20%.

Among the non-EU countries surveyed, Norway (62%) and Switzerland (59%) have the highest proportions of respondents correctly saying it is false that the world's human population is more than 10 billion, with the lowest in Albania (23%). As seen in relation to measures already reported on in this section, Kosovo has an exceptionally high proportion of respondents (48%) who are unable to say if it is true or false that the world's population is more than 10 billion.

The majority of respondents across all EU Member States correctly say that it is true that *"The continents on which we live have been moving for millions of years and will continue to move in the future"*¹³.

There are six EU Member States where at least nine in ten respondents correctly say that it is true that continents have been moving for millions of years and will continue to do so: Germany and Sweden (both 92%), Ireland, the Netherlands and Luxembourg (91% in each) and Belgium (90%). The lowest proportion is in Romania (62%), followed by Bulgaria (67%). This compares with the EU average of 82%.

¹⁰ In this question "True" is incorrect and "False" is correct.

¹¹ In this question "True" is correct and "False" is incorrect.

¹² In this question "True" is incorrect and "False" is correct.

¹³ In this question "True" is correct and "False" is incorrect.

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European citizens' knowledge and attitudes towards science and technology

Among the non-EU countries surveyed, at least nine in ten respondents correctly say that it is true that continents have been moving for millions of years and will continue to do so in Switzerland (94%) and Norway (91%), with the lowest proportions saying that this is correct in Kosovo (35%), Albania (54%), North Macedonia (60%), and Serbia (65%). Again, as seen on earlier measures in this section, Kosovo has an exceptionally high proportion of respondents (47%) unable to say if it is true or false that continents have been moving for millions of years and will continue to do.

Comparing current survey findings with those of 2005, there are eight EU Member States where the proportion of respondents correctly saying that it is true that continents have been moving for millions of years and will continue to do so has increased, with the most notable shifts in Ireland (+14 pp) and Portugal (+10 pp). Among the 16 EU Member States where the proportion who correctly say this statement is true has dropped, the most notable changes are in Austria (-10 pp), France (-9 pp), and Poland and Finland (both -8 pp).

Among the non-EU countries surveyed, the most notable change is again in Turkey, where the proportion of respondents who give a correct answer has increased (+15 pp).

Some consistent patterns emerge in terms of the extent to which people in different socio-demographic groups are able to answer the *four questions* correctly. The following groups are more likely than their counterparts to give the correct answer to all four questions:

Men, compared with women, with the most marked difference seen in relation to the size of the world's human population (men 51% correct, women 34% correct);

People who have stayed in education longer, with the most marked differences seen in relation to whether the earliest humans lived at the same time as dinosaurs – those who completed full-time education aged 20 or over (75% correct), aged 16-19 (61%), and aged 15 or under (53%); and the size of the world's population – those who completed full-time education aged 20 or over (50%), aged 16-19 (38%), and aged 15 or under (28%);

Managers and students, particularly when compared with housepersons, with the most marked differences on the questions about the size of the world's population: managers (55% correct), students (54%) and housepersons (30%); and whether human beings developed from earlier animal species: managers (77% correct), students (75%) and housepersons (54%);

People who tend not to be in financial difficulty, with the most marked differences in relation to the question about whether the earliest humans lived at the same time as dinosaurs – those who 'never' or 'almost never' have difficulties paying their household bills (70% correct); those who have difficulties 'from time to time' (58%); and those who have difficulties 'most of the time' (50%).

People who use the internet, particularly those who use it every day, with the most marked differences in relation to the questions about whether human beings developed from earlier animal species – use the internet every day (70% correct), use it

sometimes/often (55%), never use it (49%); and whether the continents have been moving for millions of years and will continue to do so – use the internet every day (85% correct), use it sometimes/often (73%), never use it (64%).

In relation to age, younger people are more likely than older people to give correct answers on three of the quiz questions. The exception is the question about whether the continents have been moving for millions of years and will continue to do so, where there are no notable differences across the age groups among those who correctly say that this is true.

There are also some consistent patterns in relation to some of the key variable groups. Most notably, the proportion of respondents who answer all four questions correctly is higher among people who think that the overall influence of science and technology on society is positive; those who are more interested in new scientific discoveries and developments, new medical discoveries and environmental problems; and those who have, or did have in the past, a professional association with research, science and innovative technology development, either through their own work or the work of a family member.

5. Knowledge of the natural and physical sciences

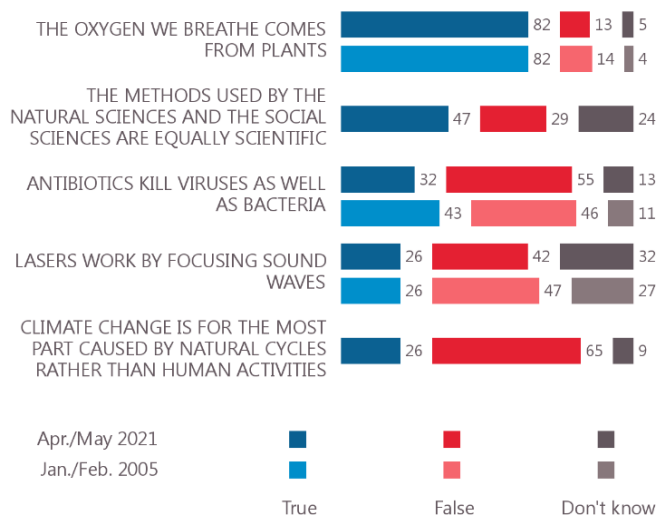
This section of the report focuses on five statements that relate to the natural and physical sciences:

- “Antibiotics kill viruses as well as bacteria” (FALSE);
- “The oxygen we breathe comes from plants” (TRUE);
- “Lasers work by focusing sound waves” (FALSE);
- “Climate change is for the most part caused by natural cycles rather than human activities” (FALSE);
- “The methods used by the natural sciences and the social sciences are equally scientific” (TRUE).

Across the five statements about science covered in this section, people are most likely to be able to correctly say that it is true that “The oxygen we breathe comes from plants”. The large majority of respondents in the EU (82%) correctly say that this statement is true. One in eight respondents (13%) incorrectly say that it is false. A very small minority (5%) are unable to say if it is true or false.

Two-thirds (65%) of respondents correctly say that it is false that “Climate change is for the most part caused by natural cycles rather than human activities”¹⁴. A quarter of respondents (26%) incorrectly say that the statement is true. One in eleven respondents (9%) are unable to say whether it is true or false.

QA20 Finally, for each of the following statements, please indicate whether you believe them to be true or false. If you don't know, you can just indicate so.
 (% - EU)



More than half of respondents (55%) correctly say that it is false that “Antibiotics kill viruses as well as bacteria”. A third of respondents (32%) incorrectly think that the statement is true. One in eight respondents (13%) are unable to say if it is true or false.

Nearly half (47%) of respondents think that “The methods used by the natural sciences and the social sciences are equally scientific”¹⁵ is true. Three in ten respondents (29%) incorrectly say that this is false; and around one in four (24%) are unable to express an opinion.

Respondents are least likely to know that that “Lasers work by focusing sound waves” (42%). A quarter of respondents (26%) incorrectly think that this is true, and a notably large proportion of respondents (32%) are unable to give an answer.

Three of these questions were included in an earlier Eurobarometer Survey (Special Eurobarometer 224 EB 63.1) conducted in 2005. Since then, there has been a notable increase in the proportion correctly saying that it is false that antibiotics kill viruses as well as bacteria (+9 pp). In relation to whether lasers work by focusing on sound waves, there has been a drop in the proportion correctly saying that this is false (-5 pp). The results for the question about whether the oxygen we breathe comes from plants are very similar across the two surveys (no more than +/-1 pp difference).

Focusing on the current survey, the majority of respondents across all EU Member States correctly say that it is true that “The oxygen we breathe comes from plants”¹⁶.

The proportion of respondents correctly saying that it is true that the oxygen we breathe comes from plants ranges from 97% in Slovenia, and 90% in Latvia, to 70% in Belgium. This compares with the EU average of 82%.

Among the non-EU countries surveyed, Albania has a very low proportion of respondents (52%) correctly saying that it is true that the oxygen we breathe come from plants. As seen in relation to measures reported earlier, Kosovo also has a notably high proportion of respondents (22%) who don't know whether the statement is true or false, as does Albania (19%).

Comparing the current results with those from 2005, there are 13 EU Member States where the proportion of respondents who correctly saying that it true that the oxygen we breathe comes from plants has increased, with the most notable changes in Malta (+16 pp), Cyprus (+14 pp) and Ireland (+10 pp). There are 12 EU Member States where the proportion who correctly say this statement is true has dropped, with the most notable shifts in Hungary (-17 pp), Estonia (-12 pp) and Romania (-11 pp).

Among the non-EU countries surveyed, the largest change is in Turkey where, in line with findings reported in the previous section, the proportion of respondents who give a correct answer has increased (+6 pp).

¹⁴ This is a new item that was not asked in 2005.
¹⁵ This is a new item that was not asked in 2005.

¹⁶ In this question “True” is correct and “False” is incorrect.

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Focusing on the current survey, in almost all EU Member States (24/27), the majority of respondents correctly say it is false that *"Climate change is for the most part caused by natural cycles rather than human activities"*¹⁷:

At least three-quarters of respondents correctly say it is false that climate change is for the most part caused by natural cycles rather than human activities in four countries: Portugal (84%), the Netherlands (80%), Ireland (77%) and Belgium (76%). This compares with the EU average of 65%. By contrast, there are three countries where only a minority of respondents correctly say that this statement is false: Romania (40%), Slovakia (46%) and Hungary (47%). The proportion of respondents unable to give an answer is highest in Bulgaria (20%), compared with the EU average of 9%. Among the non-EU countries, the highest proportion of respondents saying that it is false that climate change is for the most part caused by natural cycles rather than human activities is found in Switzerland (75%). The only non-EU countries where a minority of respondents correctly say that it is false that climate change is mostly caused by natural cycles rather than human activities are Albania (22%) and Kosovo (35%). The proportion of respondents unable to give an answer is highest in Kosovo (28%), followed by Albania (22%).

In just over half of the EU Member States (14/27), the majority of respondents correctly say it is false that *"Antibiotics kill viruses as well as bacteria"*¹⁸:

There are five EU Member States where at least three-quarters of respondents correctly say that it is false that antibiotics kill viruses as well as bacteria: Sweden and Belgium (both 83%), Luxembourg (80%), Ireland (77%) and Finland (75%). This compares with the EU average of 55%. The lowest proportions of respondents correctly saying that this is false are in Greece (19%), Cyprus (20%), Bulgaria (22%) and Romania (29%).

Among the non-EU countries surveyed, respondents in Switzerland and Norway (both 79%) are the most likely to correctly say that it is false that antibiotics kill viruses as well as bacteria, with the lowest proportions of respondents correctly saying this is false in Kosovo (15%), Albania (22%), North Macedonia (32%) and Bosnia and Herzegovina (38%). Once again, Kosovo has a high proportion (25%) of respondents unable to say if the statement is true or false (compared with the EU average of 13%), although it is lower than the proportions reported on other measures.

Comparing the 2021 survey results with those from 2005, there are 24 EU Member States where the proportion of respondents correctly saying that it is false that antibiotics kill viruses as well as bacteria has increased, with a particularly large increase in Portugal (+43 pp), followed by Estonia (+32 pp), Latvia (+30 pp), Lithuania and Malta (both +28 pp), Czechia (+26 pp), Austria and Poland (both +24 pp), Belgium, Germany and Slovakia (+22 pp in each) and Ireland (+21 pp). Among the three EU Member States where the proportion who correctly say this statement is false has dropped, the most notable change is in Greece (-13 pp).

Among the non-EU countries surveyed, the largest change is again in Turkey, where the proportion of respondents who correctly say that it is false that antibiotics kill viruses as well as bacteria has increased (+24 pp). Switzerland and the UK also show big increases in the proportions who answer correctly (+18 and +14 pp respectively).

Focusing on the current survey, there are only nine EU countries where at least half of respondents correctly say that it is false that *"Lasers work by focusing on sound waves"*¹⁹:

The proportion of respondents correctly saying that it is false that lasers work by focusing on sound waves is highest in Czechia (63%), followed by Germany (58%) and Luxembourg (56%), with the lowest proportions reported in Bulgaria (16%) and Cyprus (22%). This compares with the EU average of 42%. Bulgaria (55%), along with Estonia (46%), Malta and Lithuania (both 44%) and Spain and Denmark (both 43%) have notably high proportions of respondents unable to say if it is true or false that lasers work by focusing on sound waves, compared with the EU average of 32%.

Among the non-EU countries surveyed, Switzerland is the only one where a majority of respondents (56%) correctly say that it is false that lasers work by focusing on sound waves. The countries with the lowest proportion of respondents correctly saying that this is false are Kosovo (20%), Turkey (23%) and Montenegro (25%). Kosovo, once again, has an exceptionally high proportion of respondents (55%) unable to give an answer, as has Iceland (49%).

Comparing the current results with the 2005 findings, there are 11 EU Member States where the proportion of respondents who correctly say that it is false that lasers work by focusing on soundwaves has increased, with the most notable increases in Portugal (+26 pp), Latvia (+24 pp), Lithuania (+19 pp), and Ireland (+15 pp). Among the 12 EU Member States where the proportion who correctly say this statement is false has dropped, the most notable changes are in Slovakia (-20 pp), Poland (-16 pp), Sweden (-14 pp), Denmark and Slovenia (both -12 pp) and Croatia (-11 pp).

Among the non-EU countries surveyed, the most notable changes are in Switzerland, where the proportion of respondents who correctly say that it is false that lasers work by focusing on soundwaves has increased (+9 pp); and in Norway, where the proportion who correctly say this statement is false has dropped (-11 pp).

Looking at the current survey findings, at least half of respondents across 11 EU Member States correctly say that is true that *"The methods used by the natural sciences and the social sciences are equally scientific"*²⁰:

¹⁷ For this question "True" is incorrect and "False" is correct.

¹⁸ For this question "True" is incorrect and "False" is correct.

¹⁹ In this question "True" is incorrect and "False" is correct.

²⁰ In this question "True" is correct and "False" is incorrect.

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The proportion of respondents correctly saying that it is true that methods used by the natural sciences and the social sciences are equally scientific is highest in Hungary (78%), followed by Austria (59%), Croatia (58%), and Greece (57%). The lowest proportions are in Ireland (30%), Denmark and Malta (both 33%) and Latvia (36%). This compares with the EU average of 47%. A notably high proportion of respondents say they don't know whether the statement is true or false in Bulgaria (44%), Latvia and Denmark (both 38%) and Malta (37%), compared with the EU average of 24%.

Among the non-EU countries surveyed, the proportion of respondents correctly saying it is true that methods used by the natural sciences and the social sciences are equally scientific is highest in Montenegro (59%), followed Albania and North Macedonia (both 53%), and lowest in the United Kingdom (29%). Again, as seen in relation to other measures reported in this section, Kosovo has an exceptionally high proportion of respondents (47%) unable to give an answer, as has the UK (41%).

In terms of the extent to which people in different socio-demographic groups are able to answer the five questions correctly, there are less consistent patterns. The following groups are more likely than their counterparts to give the correct answer to questions:

Men, compared with women, in relation to whether the oxygen we breathe comes from plants and if lasers work by focusing sound waves, with the most marked difference seen in relation to how lasers work (men 51% correct, women 35% correct);

People who have stayed in education longer, across all five questions, with the most marked in relation to whether antibiotics kill viruses as well as bacteria – those who completed full-time education aged 20 or over (67% correct), aged 16-19 (50%), and aged 15 or under (37%); and the least marked in relation to whether the oxygen we breathe comes from plants – those who completed full-time education aged 20 or over (83% correct), aged 16-19 and aged 15 or under (80% in each group);

Managers, students, and self-employed people, particularly when compared with housepersons and unemployed people. Across four of the measures the most notable differences are in relation to the questions about lasers, with the proportion of respondents giving correct answers ranging from 31% among housepersons to 56% among managers; and whether antibiotics kill viruses as well as bacteria, with the proportion giving correct answers ranging from 46% of unemployed people and 47% of housepersons to 69% of managers. In relation to the fifth measure – whether the methods used by natural sciences and social sciences are equally scientific – the sub-group differences are much smaller, with managers (54%) most likely to correctly say that this is true and unemployed people (41%), housepersons (42%), and retired people (43%);

Across four of the questions, people who tend not to be in financial difficulty, with the most marked differences in relation to the question about whether antibiotics kill viruses as well as bacteria – those who 'never' or 'almost never' have difficulties paying their household bills (60% correct); those who have difficulties 'from time to time' (44%); and those who have difficulties 'most of the time' (38%);

People who use the internet, particularly those who use it every day, with the most marked differences in relation to the questions about whether antibiotics kill viruses as well as bacteria – use the internet every day (59% correct), use it sometimes/often (43%), never use it (33%); and how lasers work – use it every day (46% correct), use it sometimes/often (37%), never use it (22%);

In relation to age, there are no consistent patterns across the five questions, and differences tend to be small. The most notable are in relation to the question about climate change, with people under the age of 55 more likely to correctly say that it is false that climate change is for the most part caused by natural cycles rather than human activities – 70% of 15-24 years old compared to 62% of those aged 55 and over; and the question about lasers, with people under 55 also more likely to correctly say that it is false that lasers work by focusing on sound waves – 44% of 15-54 years old compared to 39% of those aged 55 and over.

There are some consistent patterns in relation to some of the key variable groups. Most notably, the proportion of respondents who answer all five questions correctly is higher among people who are more interested in new scientific discoveries and developments and new medical discoveries; and people who say they are not very or not at all spiritual or religious.

6. Belief in conspiracy theories

The final set of statements covered in this chapter looks at beliefs in conspiracy theories using two measures:

- *"The cure for cancer exists but is hidden from the public by commercial interests"* (FALSE);
- *"Viruses have been produced in government laboratories to control our freedom"* (FALSE).

Within the EU27, more than half of respondents (55%) correctly say that it is false that *"Viruses have been produced in government laboratories to control our freedom"*. Just under three in ten respondents (28%) incorrectly say that it is true, with one in six (17%) unable to express an opinion.

More than half of respondents (56%) also correctly say that it is false that *"The cure for cancer exists but is hidden from the public by commercial interests"*. One in four respondents (26%) incorrectly say that this is true. Less than one in five respondents (18%) is unable to say whether it is true or false.

There are 15 EU Member States where the majority of respondents correctly say that it is false that *"The cure for cancer exists but is hidden from the public by commercial interests"*²¹.

There are five EU Member States where at least three-quarters of respondents correctly say that it is false that a cancer cure exists but is hidden from the public by commercial interests: Denmark and Sweden (both 83%), Finland (78%), Belgium (76%) and the Netherlands (75%). Countries where the fewest respondents correctly say that it is false that a cancer cure exists but is hidden from the public for commercial interests are Bulgaria (22%), Cyprus (27%), Greece (29%) and Romania (34%). This compares with the EU average of 56%. Bulgaria has an exceptionally high proportion of respondents (37%) unable to give an answer, as has Latvia (33%), with high proportions also reported in Estonia (29%) and Croatia (27%), compared with the EU average of 18%.

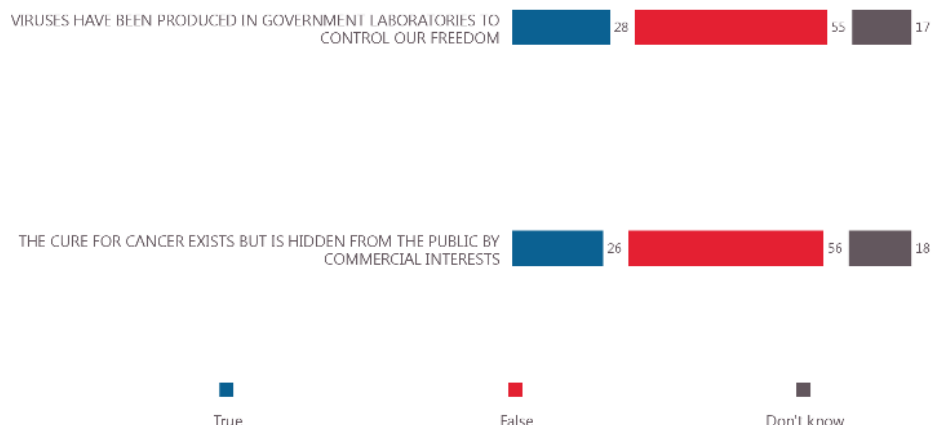
Among the non-EU countries surveyed, Norway is the only one where more than three-quarters of respondents (79%) correctly say that it is false that the cure for cancer exists but is hidden from the public by commercial interests. It is followed by the UK (71%). Less than one in four respondents correctly say that this is false in Kosovo (21%) and Montenegro (23%). As seen in relation to other measures reported in this chapter, the proportion of respondents unable to give an answer on this measure is high in Kosovo (34%).

There are 13 EU Member States where the majority of respondents correctly say that it is false that *"Viruses have been produced in government laboratories to control our freedom"*²².

There are six EU Member States where at least seven in ten respondents correctly say that it is false that viruses have been produced in government laboratories to control our freedom: the Netherlands (84%), Denmark (83%), Sweden (75%), Belgium (74%), Ireland (73%) and Germany (70%). By contrast, less than three in ten respondents correctly say this statement is false in Bulgaria (19%), Cyprus (26%) and Croatia (28%). This compares with the EU average of 55%. The countries with the highest proportions of respondents unable to give an answer are Latvia and Portugal (both 31%), Bulgaria, Malta and Lithuania (29% in each), and Estonia (27%), compared with the EU average of 17%.

Among the non-EU countries surveyed, at least seven in ten respondents correctly say that it is false that viruses have been produced in government laboratories to control our freedom in Norway (75%) and Switzerland (74%). By contrast, less than three in ten respondents correctly say that this is false in Kosovo (18%), Turkey and Montenegro (both 22%) and North Macedonia and Albania (both 24%). Again, Kosovo has a high proportion of respondents (29%) who are unable to give an answer, as has Turkey (27%).

QA20 Finally, for each of the following statements, please indicate whether you believe them to be true or false. If you don't know, you can just indicate so. (% - EU)



²¹ In this question "True" is incorrect and "False" is correct.

²² In this question "True" is incorrect and "False" is correct.

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Some consistent patterns emerge in terms of the extent to which people in different socio-demographic groups are able to answer both questions correctly. The following groups are more likely than their counterparts to give the correct answer to the two questions:

Men, when compared with women (6 pp. more men give the correct answer for both questions);

People who have stayed in education longer, with the most marked differences seen in relation to whether viruses have been produced in government laboratories to control our freedom – those who completed full-time education aged 20 or over (66% correct), aged 16-19 (48%), and aged 15 or under (38%);

Managers and, to a lesser extent, students, particularly when compared with housepersons and unemployed people, with, again, the most marked differences seen for the question about viruses being produced in government laboratories – managers (71% correct), students (62%) compared with housepersons (40%) and unemployed people (41%);

People who tend not to be in financial difficulty, with somewhat more marked differences in relation to the question about viruses being produced in government laboratories – those who 'never' or 'almost never' have difficulties paying their household bills (60% correct); those who have difficulties 'from time to time' (43%); and those who have difficulties 'most of the time' (31%);

In relation to age, differences are not particularly marked and not consistent across the two questions. People aged 15-24 and 40-54 are somewhat more likely than other age groups to give a correct answer in relation to whether a cancer cure exists – 15-24 year olds (59%), 40-54 year olds (58%), 25-39 year olds (56%), those aged 55 and over (55%). Young people aged 15-24 are somewhat more likely than those aged 25 and over to give a correct answer in relation to whether viruses are produced in government laboratories – 15-24 year olds (58%), compared with those aged 25 and over (53%-55%).

There are more consistent patterns in relation to some of the other key variable groups. Most notably, the proportion of respondents who answer both questions correctly is higher among people who think that the overall influence of science and technology on society is positive; those who are more interested in new scientific discoveries and developments, new medical discoveries and environmental problems; those who say they are not very or not at all spiritual or religious; and those who have, or did have in the past, a professional association with research, science and innovative technology development, through both their own work and that of a family member.

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7. Overall science literacy

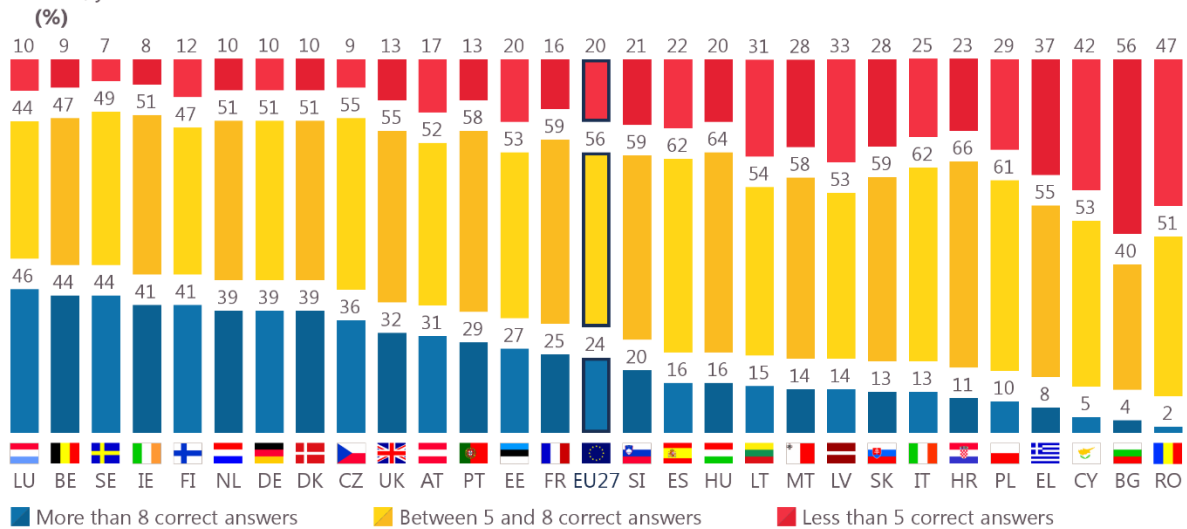
The final section of this chapter presents an overview looking at the number of correct and incorrect answers respondents gave across all 11 'quiz' questions that were included in the survey.

Within the EU, around one-fifth of respondents (24%) correctly answered more than eight out of 11 questions, over half (56%) give between five and eight correct answers, and around one in five (20%) are able to provide less than five correct answers.

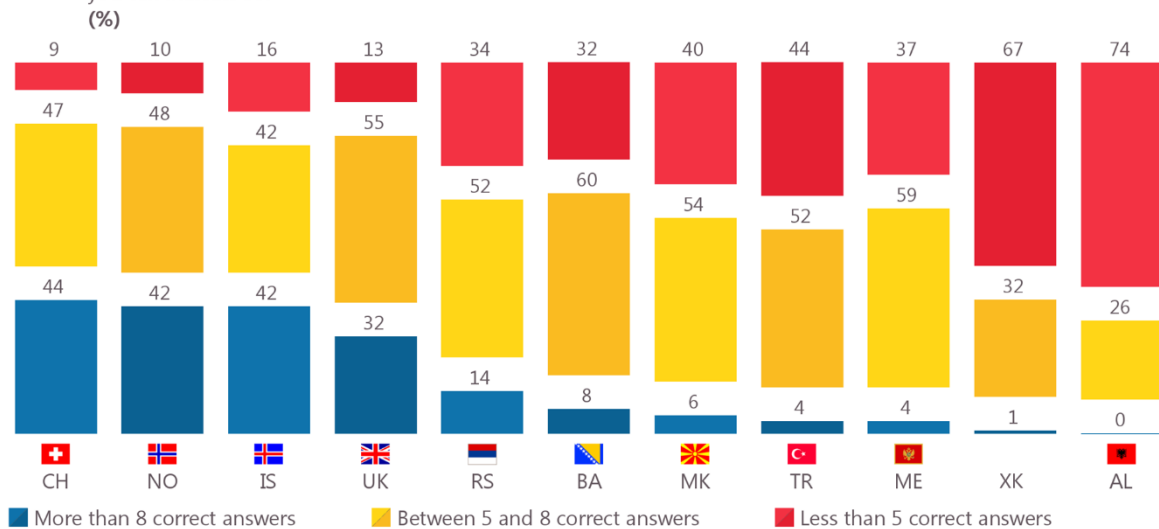
In the EU, respondents are most likely to be able to give more than eight correct answers in Luxembourg (46%), Belgium and Sweden (both 44%), Ireland and Finland (both 41%), Denmark, the Netherlands and Germany (all 39%). The countries where respondents are most likely to give less than five correct answers are Bulgaria (56%), Romania (47%) and Cyprus (42%).

Among the non-EU countries surveyed, respondents are most likely to be able to give more than eight correct answers in Switzerland (44%), Norway and Iceland (both 42%), and most likely to be able to provide less than five correct answers in Albania (74%), Kosovo (67%) and Turkey (44%).

QA20T. For each of the following statements, please indicate whether you believe them to be true or false. If you don't know, you can indicate so.



QA20T. For each of the following statements, please indicate whether you believe them to be true or false. If you don't know, you can indicate so.



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The socio-demographic differences, in terms of the number of correct and incorrect answers respondents gave across the 11 questions, reflect the survey findings already described in section 3 of this chapter. Thus, the groups more likely to give correct answers across all the quiz questions are:

Men, who are more likely than women to give more than eight correct answers (29% vs 19%). Women are somewhat more likely than men to give between five and eight correct answers (58% vs 54%) and to provide less than five correct answers (23% vs 17%);

People aged 54 and under are more likely than those aged 55 and over to give more than eight correct answers (25%-29% of those aged 54 and under vs 20% of those aged 55 and over), and less likely to give less than five correct answers (16%-18% of those 54 and younger vs 24% of those 55 and older);

People who finished full-time education aged 20 or over (36%) are more likely to give more than eight correct answers than those who completed their full-time education aged 15 and under (9%) or 16-19 (16%);

Managers (41%) and students (33%) are more likely than those in other occupational groups, particularly unemployed people (16%) and housepersons (12%) to give eight or more correct answers; and less likely to give less than five correct answers (managers 8% and students 13% compared to unemployed people 28% and housepersons 34%);

People who rarely or never have difficulties paying their household bills (28%) are more likely to give more than eight correct answers than those who have difficulties 'from time to time' (13%) or 'most of the time' (9%); and less likely to provide less than five correct answers ('most of the time' 40%, 'from time to time' 29%, 'almost never' or 'never' (16%));

The likelihood of scoring well on the quiz is associated with greater internet usage. Among people who use the internet every day, 27% give more than eight correct answers, compared with 11% of those who use the internet often or sometimes and 6% of those who do not use the internet.

In terms of differences across key variable groups, it is not surprising to find that people who say they are interested in the three areas of science (new medical discoveries, new scientific discoveries and technological developments, and environmental problems) are more likely to score highly in the quiz e.g. in relation to interest in new scientific discoveries: 35% of those who say they are "very interested" give more than eight correct answers; 22% of those who are "moderately interested"; and 9% of those who are "not at all interested". Conversely, those who say they are "not at all interested" in new scientific discoveries are more likely to give less than five correct answers (37%), compared with those who are "moderately interested" (19%) and "very interested" (11%). It is also not surprising that people who think science and technology has a positive influence on society and people who have some connection with work in a scientific profession, particularly those who have a personal and family member connection are more likely to score highly.

II. VIEWS ON THE IMPACTS OF SCIENCE AND TECHNOLOGY



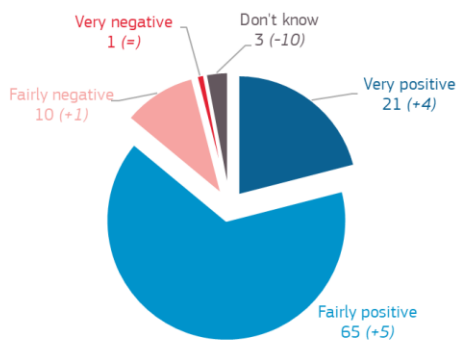
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1. Overall influence of science and technology on society

Respondents were asked if they thought the overall influence of science and technology in society is positive or negative.

Across the EU almost nine in ten (86%) respondents think the overall influence is positive, with 21% saying it is 'very positive'. Just over one in ten (11%) think science and technology has a negative influence, with 1% saying it is 'very negative'. Fewer than one in twenty (3%) say they don't know.

QA6 Do you think that the overall influence of science and technology on society is...? (% - EU27)



(Apr./May 2021 - Apr./May 2013)

More than seven in ten respondents in every EU Member State think the overall influence of science and technology on society is positive, with proportions ranging from 99% in Portugal, and 96% in Estonia, Ireland and Sweden, to 72% in Romania, 76% in France and 80% in Austria. Romania is the only country where at least one in five respondents think the overall influence is negative. The proportion of respondents who think the overall influence is 'very positive' is highest in Portugal (49%), Ireland and Lithuania (both 39%) and Spain (36%).

Opinion is more positive than it was in 2013, with a nine percentage point increase in the proportion who think science and technology has a positive influence on society. This has been driven by a decline in the proportion that say they don't know (-10 pp), as the proportion that think the influence is negative has remained stable (+1 pp).

In every Member State, opinion is more likely to be positive than it was in 2013, with the largest increases observed in Portugal (+30 pp), Czechia (+20 pp) and Malta (+19 pp). The proportion that thinks the overall influence of science and technology is 'very positive' has increased considerably in Portugal (+40 pp), Czechia (+17 pp), Spain (+14 pp) and Belgium (+12 pp).

Outside the EU, respondents in the United Kingdom are now much more likely to say the influence is positive than they were in 2013 (+19 pp).

The socio-demographic analysis reveals little difference based gender and age but opinions do vary by the following characteristics:

The longer a respondent remained in education, the more likely they are to think the influence of science and technology is positive: 92% of those who completed education aged 20 or older think this way, compared to 76% who completed aged 15 or younger;

In terms of occupation, managers (92%), students (90%), the self-employed and other white-collar workers (both 89%) are more likely than other occupation groups, especially retired people (82%), to think the influence is positive.

Analysis also shows that the fewer difficulties a respondent has paying household bills, the more likely they are to think the influence of science and technology is positive: 89% of those who experience the least financial difficulties think this way, compared to 76% who experience difficulties most of the time;

Respondents who answers more 'science quiz' questions correctly are also more likely to think that the overall influence of science and technology on society is positive: 95% of those who give eight or more correct answers say the influence is positive compared to 76% of those who give less than five correct answers.

2. Effects of new technologies on society

Respondents were asked about the effect of different technologies being developed in the next 20 years on our way of life.

Almost all respondents think solar energy (92%) will have a positive effect, while 87% say this about wind energy²³. More than eight in ten think vaccines and combatting infectious diseases²⁴ (86%) or information and communication technology²⁵ (82%) will have a positive impact. Almost three-quarters (73%) of respondents think nanotechnology will have a positive impact on life in the next 20 years, while 71% say this about brain and cognitive enhancements²⁶, 70% say this about biotechnology and genetic engineering, and 69% say this about space exploration. Respondents are least likely to think new technologies in artificial intelligence²⁷ (61%) or nuclear energy for energy production (46%) will have a positive impact. Nuclear energy is the only area where the positive view does not have a majority.

Compared to 2005, respondents are now much more likely to say new technologies in nanotechnology (+25 pp) will have a positive effect. As a result, the positive view has gone from being a minority to a majority position. There has also been a 12-point increase in the proportion that thinks the effect will be 'very positive'. Conversely, respondents are now less likely to be positive about nuclear energy for energy production (-7 pp).

At least three-quarters of respondents in every EU country think solar energy will have a positive effect on our way of life in the next 20 years. This view is almost universal in Malta and Portugal (99%) and Ireland (98%). By contrast, it is also held by 75% in Romania, 86% in Poland and 90% in Latvia, Croatia and Czechia (countries with the lowest number of respondents agreeing that solar energy will have a positive impact on our way of life).

In 22 countries more than half of respondents say solar will have a 'very positive' effect.

The majority of respondents in every non-EU country also think solar energy will have a positive effect, with proportions ranging from 97% in Switzerland and Iceland to 58% in Albania.

Compared to 2005, respondents in 20 countries are now more likely to think the influence of solar energy will be positive, with the largest increases seen in Greece (+23 pp), Lithuania (+20 pp) and Cyprus (+19 pp).

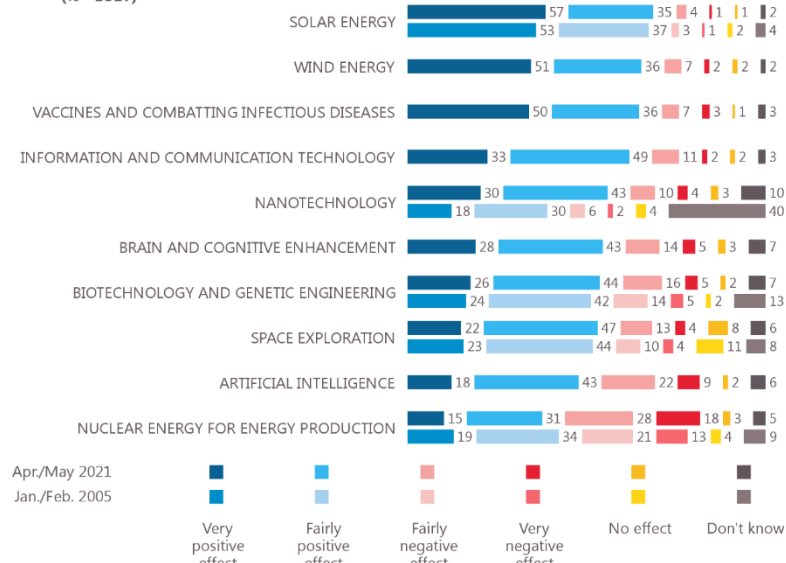
There are only five countries where the positive view has declined but the changes are small (1-3 pp), for instance Austria and Czechia (-2 pp) and France (-1 pp). There has been no change in opinion in Belgium and Slovenia. It is worth noting that there are 15 countries where the proportion that think the effect will be 'very positive' has increased by more than 10 points, with the largest increases in Portugal (+46 pp), Ireland (+40 pp) and Cyprus (+39 pp). By contrast, this view has declined 19 percentage points in Czechia and 10 percentage points in France.

In the four non-EU countries included in both 2005 and 2021 (United Kingdom, Turkey, Norway, Switzerland) respondents are now more likely to say the influence of new technologies in solar energy will be positive, with the largest increase in Turkey (+14 pp).

More than three-quarters of respondents in every EU country think wind energy will have a positive effect, with proportions ranging from 99% of respondents in Portugal, 98% in Malta and 97% in Ireland, to 76% in France and Romania, and 84% in Poland. In 19 countries at least half of all respondents think new technologies in wind energy will have a 'very positive' effect.

In every non-EU country, the majority of respondents think wind energy will have a positive effect, with the largest proportion in Iceland (96%) and the smallest in Albania (58%).

QA8a The following is a list of areas where new technologies are currently being developed. For each of these, do you think it will have a positive, a negative or no effect on our way of life in the next 20 years? (% - EU27)



²³ This item is a new item and was not asked in 2005.

²⁴ This item is a new item and was not asked in 2005.

²⁵ This item is a new item and was not asked in 2005.

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The majority of respondents in every EU country think new technologies in *information and communication technology* will have a positive effect on life in the next 20 years. This opinion is most widespread in Portugal (98%), Malta (94%), and Ireland and Cyprus (both 91%), but is also held by 67% in France, 72% in Romania and 80% in Slovenia, Poland and Hungary (the countries with the lowest proportion of respondents agreeing that the impact will be positive). There are three countries where at least half of respondents think the effect will be 'very positive': Malta (60%), Cyprus (59%) and Portugal (57%).

The majority of respondents in every non-EU country surveyed also think new technologies in this area will have a positive effect, with proportions ranging from 93% in Iceland and 92% in the UK to 58% in Albania.

In all but one EU country more than six in ten respondents think *nanotechnology* will have a positive effect on our way of life in the next 20 years, with respondents in Portugal (96%), Czechia (94%) and Estonia (92%) the most likely to think this way. At the other end of the scale, 46% in Romania, and 65% in Poland, Austria, France and Bulgaria also think the effect will be positive. Czechia (62%) and Portugal (61%) are the only countries where at least half think the effect will be 'very positive'.

There is a broad range of opinion in non-EU countries, where the proportion that think nanotechnology will have a positive effect ranges from 91% of respondents in Norway to 38% in Kosovo. However, in spite of this range a positive effect is the most common answer in all non-EU countries.

Respondents in every Member State are now more likely than those in 2005 to say nanotechnology will have a positive effect on our way of life. In fact, Romania (+4 pp) is the only country where the increase has been less than 15 percentage points. There are six countries where the positive view has increased by more than 50 points, with the largest seen in Malta (+67 pp), Latvia (+63 pp) and Lithuania (+57 pp). In addition, the proportion that think the effect will be 'very positive' has increased by more than 10 percentage points in 16 countries, with the largest increases seen in Portugal (+45 pp), Czechia (+41 pp) and Malta (+36 pp).

This positive trend is also seen in non-EU countries, with increases in the proportion that think the effect will be positive of between 61 points in Turkey and 37 points in Switzerland.

Opinion is more varied about *brain and cognitive enhancement*. Almost all respondents in Portugal (96%) think these will have a positive effect, as do 88% in Malta and 86% in Czechia, Estonia, Ireland and Finland. At the other end of the scale, 38% in Sweden think the impact will be positive, as do 53% in Slovenia and 55% in Greece. Sweden is the only country where the majority think the effects of brain and cognitive enhancement will be negative (55%) – in fact 17% say the effects will be 'very negative'.

Outside the EU, the view that the effect of new technologies in brain and cognitive enhancement will be positive is dominant in every country, although proportions range from 90% in Turkey to 47% in Albania.

In every EU Member State the majority of respondents think the effect of new technologies in *biotechnology and genetic engineering* will be positive. Proportions range from 93% in Portugal, 90% in Estonia, and 82% in Finland and Sweden, to 55% in Romania and Austria and 60% in Croatia. More than one in ten respondents in every country think the effects will be 'very positive'.

In countries outside the EU, the proportion of respondents who think the effect will be positive ranges from 93% in Iceland to 40% in Serbia.

Opinion has become more positive in 21 countries since 2005, with the largest increases observed in Portugal (+31 pp), Belgium (+23 pp) and Malta (+21 pp). In fact, in six countries there has been an increase of at least ten points in the proportion that say the effect will be 'very positive', and this is the case in Portugal (+28 pp), Estonia (+21 pp) and Finland (+15 pp). By contrast, the proportion that think biotechnology and genetic engineering will have a positive effect has declined in six countries, and particularly amongst respondents in Romania (-10 pp) and Denmark (-9 pp). The proportions that think the effect will be 'very positive' has also declined notably in Romania (-17 pp), Denmark and Luxembourg (both -11 pp).

Outside of the EU, the positive view has increased in all four countries that were included in both surveys, but the only notable increases are in Turkey (+23 pp) and the United Kingdom (+12 pp).

More than half of respondents in every EU country think *space exploration* will have a positive effect on life in the next 20 years. This view is held by at least eight in ten respondents in Portugal (86%), Czechia (85%) and Bulgaria and Estonia (both 80%), and by 55% in Romania and 65% in Malta, Cyprus, France and Spain, which have the lowest proportion of respondents agreeing that the impact will be positive. In 16 countries at least one in five respondents think the effect of space exploration will be 'very positive', with the highest levels in Bulgaria (34%), Czechia (30%) and Portugal (29%).

In every non-EU country, the majority of respondents think space exploration will have a positive effect. The largest proportion is seen in Turkey (86%) and the smallest in Albania (56%).

The proportion that think space exploration will have a positive effect has increased in 17 countries since 2005, with the largest seen in Portugal (+23 pp), and Ireland and the Netherlands (+17 pp each). The positive view has declined in eight countries, and particularly amongst respondents in Romania (-17 pp), Slovenia (-11 pp) and Cyprus (-10 pp). There has been no change in opinion in Denmark or France.

The positive view has also increased in all four non-EU countries surveyed in 2021 and 2005, with the largest in Turkey (+13 pp), the United Kingdom (+11 pp) and Switzerland (+10 pp).

The majority of respondents in every Member State think *artificial intelligence* will have a positive effect on our way of life in the next 20 years. At least seven in ten respondents in Malta (79%), Portugal (77%), Belgium and Ireland (both 70%) think this way (highest proportions), as do 49% in Romania, 53% in Austria and

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54% in Slovakia (lowest proportions). The largest proportions of respondents who think there will be a 'very positive' effect are seen in Malta (38%), Portugal (29%) and Italy and Cyprus (both 25%).

The proportion of respondents in non-EU countries who think the effect of these new technologies will be positive varies from 76% in Iceland to 39% in Serbia.

There is a broad range of opinions about the effect of *nuclear energy*. In 20 countries the majority think the effect will be positive, with respondents in Czechia (79%), Bulgaria (69%) and Slovakia (66%) the most likely to do so. This compares to 25% in Germany, 30% in Austria and 35% in Greece; in these three countries and in Luxembourg, Denmark and Portugal the majority think the effect will be negative, while in France opinion is divided (positive 45%, negative 45%). The largest proportions of respondents who think the effect will be 'very positive' are seen in Czechia (31%), Malta (29%) and Sweden (28%).

Opinion in countries outside the EU also varies considerably, with the proportion that think the effect will be positive ranging from 70% in Turkey to 34% in Switzerland. The negative view is held by the majority in Switzerland (63%), Iceland (57%) and Serbia (55%), while in Montenegro opinion is divided (40% positive, 40% negative).

The trends since 2005 are mixed. In 15 countries the proportion that thinks the effects of new technologies in nuclear energy will be positive has increased, with the largest seen in Czechia (+22 pp), Estonia (+19 pp) and the Netherlands (+17 pp). On the other hand, in 12 countries respondents are now less likely to be positive, with the largest declines seen in Romania (-21 pp), Germany (-19 pp) and Italy (-10 pp). The proportion that thinks the effect will be 'very positive' has increased by ten points in Finland, but has declined in Romania (-24 pp), Greece and Cyprus (-10 pp each).

Outside of the EU, respondents in Norway are now much more likely to hold a positive view in general (+30 pp), and they are also more likely to say the effects of new technologies in nuclear energy will 'very positive' (+10 pp).

The socio-demographic analysis shows a few patterns:

Men are more likely than women to have a positive opinion about the impact of several technological areas on life in the next 20 years. For example, 66% think the impact of artificial intelligence will be positive, compared to 57% of women. Other areas where men are more likely to be positive are nanotechnology (77% vs 70%), biotechnology and genetic engineering (73% vs 67%), space exploration (72% vs 64%) and nuclear energy for energy production (51% vs 43%).

Respondents aged 15-54 are more likely than their older counterparts to think there will be a positive impact from nanotechnology, brain and cognitive enhancements, biotechnology and genetic engineering, space exploration, artificial intelligence or nuclear energy for energy production. For example, 75% of those aged 15-39 and 72% of 40-54 year olds think new technologies in biotechnology and genetic engineering will have a positive impact, compared to 64% of those aged 55 and older.

The longer a respondent remained in education, the more likely they are to think each of these areas will have a positive impact on life in the next 20 years. The effect is most pronounced in the case of nanotechnology: 81% who stayed in education the longest think new technologies in this area will have a positive effect, compared to 55% who completed education aged 15 or younger.

The fewer the difficulties a respondent experiences paying bills, the more likely they are to think new technologies in each of these areas will have a positive impact. For example, 46% who experience the least financial difficulties are positive about the potential impact of nuclear energy for energy production, compared to 39% of those who experience the most difficulties. The exception is space exploration, where there is little difference.

The analysis also shows respondents who live in towns are more likely to be positive about the effect of new technologies in nanotechnology, brain and cognitive enhancements, biotechnology and genetic engineering, space exploration or artificial intelligence. For instance, 64% in large towns think the effect of new technologies in artificial intelligence will be positive, compared to 55% of those living in rural villages.

Respondents who place themselves to the right of the political spectrum (58%) much more likely to think new technologies in nuclear energy will be positive, compared to those in the centre (45%) or on the left (42%). The other technologies are generally favoured more by people who place themselves on the left of the political spectrum.

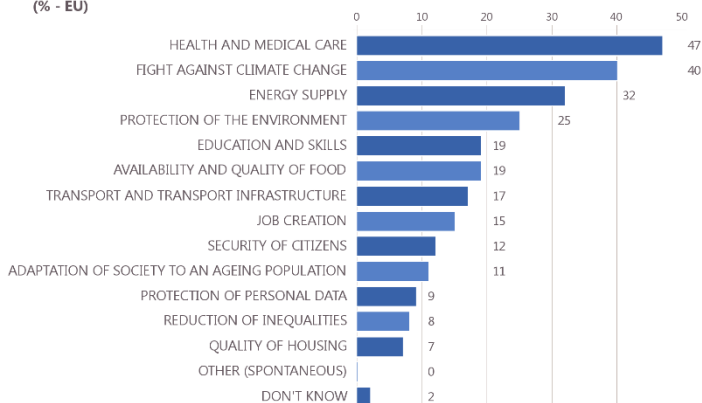
Finally, and perhaps not surprisingly, respondents who think the influence of science and technology is positive are much more likely to say new technologies in each of these areas will have a positive impact, compared to those who think the influence is negative.

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Respondents were provided with a list and asked which **areas would be most affected by research and innovation** in the coming years.

Almost half of all respondents think health and medical care (47%) will be most affected by research and innovation. This is the most mentioned area, followed by the fight against climate change (40%) and the energy supply (32%). One quarter (25%) think protection of the environment will be affected the most by research and innovation, while almost one in five respondents mention the availability and quality of food (19%), education and skills (19%), or transport and transport infrastructure (17%). More than one in ten respondents think job creation (15%), the security of citizens (12%) or the adaption of society to an ageing population (11%) will be most affected. Finally, fewer than one in ten think the protection of personal data (9%), a reduction of inequalities (8%) or quality of housing (7%) will be most affected by research and innovation in the coming years.

QA8b In the coming years, which of the following areas do you think will be affected most by research and innovation? (MAX. 3 ANSWERS) (% - EU)



Across the EU, 47% of respondents think *health and medical care* will be most affected by research and innovation, but at a country level the proportions that think this way range from at least six in ten in Malta (70%), Czechia (66%), Greece (61%) and Belgium (60%) to no more than four in ten in Romania (33%), Slovenia (38%), Spain and Denmark (both 40%).

In the non-EU countries surveyed the variation is even wider: from 64% of respondents in the UK to 17% in Albania. In the EU, this is the most mentioned area by respondents in 20 countries and is the also most mentioned in Slovenia along with energy supply, and in France along with the fight against climate change. It is the second most mentioned area in Portugal and Germany, and the third most mentioned in Finland, Sweden and Denmark.

Respondents in Sweden (62%), Denmark (57%) and the Netherlands (55%) are the most likely to say *the fight against climate change* will be most affected, particularly when compared to those in Romania (13%), Greece (25%) and Spain (28%). This is the most mentioned area by respondents in Denmark, Portugal (52%), France (49%, equal to health and medical care) and Germany (47%). It is the second most mentioned area in 14 countries, and the third most mentioned in seven others. Amongst the non-EU countries surveyed, respondents in Iceland

(58%) are most likely to mention the fight against climate change, with those in Albania (6%) the least likely to do so.

The proportion of respondents who think *energy supply* will be the most affected by research and innovation varies considerably between countries: from 67% in Sweden and 55% in the Netherlands and Belgium to 11% in Romania, 13% in Cyprus and 14% in Spain. This is also the most mentioned area in Sweden and Finland (52%) and is the most mentioned in Slovenia along with health and medical care (both 38%). It is the second most mentioned area in seven countries, and the third most mentioned in ten others. In the 11 non-EU countries surveyed, energy supply is most often mentioned by those in Norway (54%) and is least mentioned by those in Albania (5%).

Only a minority of respondents in each country think *protection of the environment* will be most affected by research and innovation, with the highest proportions observed in France (35%), Czechia (34%) and Ireland (31%). At the other end of the scale 10% of respondents in Sweden, 14% in the Netherlands and 17% in Romania mention environmental protection. This is the second most mentioned item in France and Czechia, and the third most mentioned in Slovenia and Slovakia. Except for Albania (4%), more than one in ten respondents in the other non-EU countries surveyed mention protection of the environment as being most affected, with the highest proportion seen in Iceland (33%). The Netherlands (27%) is the only country where at least one-quarter think the availability and quality of food will be the most affected by research and innovation in the coming years.

The results from non-EU countries fall within a similar range, with the highest proportion of mentions observed in Turkey (24%) and the lowest in Albania and Kosovo (both 6%).

Education and skills are most often mentioned by respondents in Cyprus and Greece (both 42%) and Czechia (32%), and least often mentioned by those in Sweden (10%), Belgium and Austria (both 15%). This is the second most mentioned area in two countries, and the third most mentioned in three. The proportion of respondents in non-EU countries mentioning this area ranges from 44% in Kosovo (the highest of any country surveyed) to 10% in Albania.

More than one-quarter of respondents in Sweden (36%), Latvia (27%) and Germany (26%) think *transport and transport infrastructure* will be the most affected by research and innovation in coming years. At the other end of the scale 3% in Cyprus, 10% in Greece and 11% in Croatia think the same way. Outside of the EU, respondents in Switzerland (27%) are the most likely to mention transport and transport infrastructure, while those in North Macedonia and Kosovo (both 4%) are the least likely to do so.

Job creation is most often mentioned by respondents in Cyprus (26%), and Greece and Romania (both 25%), and least mentioned by those in the Netherlands and Sweden (both 5%) and Denmark (6%). However, the largest proportion of respondents mentioning this are observed outside of the EU in Kosovo (36%), compared to 6% in Switzerland. Within the EU this is the second most mentioned area in Romania, and the third most mentioned in Greece and Spain.

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Cyprus and Romania (both 22%) are the only EU countries where at least one in five mention the *security of citizens*, followed by 19% in Greece. Amongst non-EU countries the proportion of respondents mentioning security ranges from 24% in Albania to 4% in Switzerland.

Portugal (23%) is the only country where more than one in five think the *adaption of society to an ageing population* will be most affected by research and innovation, followed by 14% of respondents in Slovenia, Malta, Estonia, Luxembourg and Belgium. At the other end of the scale, 6% of respondents in Bulgaria, 7% in Cyprus and 8% in Hungary and Sweden also mention this area. In countries outside of EU adaption of society to an ageing population is most mentioned by respondents in Norway and Iceland (17% each) and least mentioned by those in Albania (5%).

The proportion of respondents who mention the *protection of personal data* ranges from 18% in Portugal, and 15% in Lithuania and Spain, to 5% in Sweden and Hungary, and 6% in Germany and Slovakia. In non-EU countries the proportion ranges from 18% of respondents in Turkey to 6% in Serbia.

France (13%) and Romania (10%) are the only countries where at least one in ten thinks the *reduction of inequalities* will be most affected by research and innovation. This compares to 2% of respondents in Sweden and Czechia. The highest proportion of respondents mentioning this area is actually found outside of the EU in Albania (29%).

Finally, *quality of housing* is mentioned by at least one in ten respondents in Austria (12%), Romania and Poland (both 11%) and France (10%), but by only 2% in Sweden. In countries outside the EU proportions range from 16% in North Macedonia to 3% in Bosnia and Herzegovina, the United Kingdom, Norway and Switzerland.

The socio-demographic analysis illustrates that men are more likely than women to mention energy supply (34% vs 29%) or transport and transport infrastructure (20% vs 15%) as the most affected by research and innovation in coming years.

It also shows that the older the respondent, the more likely they are to mention health and medical care, and the less likely they are to mention the protection of personal data, though the effect is not large. For example, 50% of those aged 50 and older mention health and medical care, compared to 43% of those aged 15–24.

The longer a respondent remained in education, the more likely they are to mention the fight against climate change, energy supply or transport and transport infrastructure. For instance, 45% who completed education aged 20 or older mention climate change, compared to 32% who completed education aged 15 or younger.

The analysis also reveals managers (47%) are more likely to mention the fight against climate change than those in other occupation groups. In addition, the fewer difficulties a respondent has in paying bills, the more likely they are to mention the fight against climate change or energy supply, and the less likely they are to mention job creation or the security of citizens. For example, 34% of those who experience the least financial difficulties

mention energy supply, compared to 24% who experience the most difficulties.

Respondents who think the influence of science and technology is positive are more likely than those who think the influence is negative to mention health and medical care (49% vs 36%), the fight against climate change (41% vs 29%) or energy supply (33% vs 22%), but less likely to mention the security of citizens (11% vs 17%). Finally, respondents who place themselves on the left (45%) or in the centre (41%) of the political spectrum are more likely to mention the fight against climate change than those on the right (34%).

3. Opinions on the benefits of science and technology

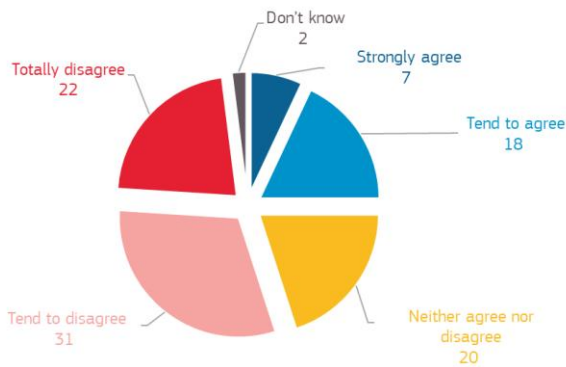
Respondents were asked how strongly they agreed or disagreed with the statement “*Science and technology do not really benefit people like you*”.

One quarter (25%) of respondents agree that science and technology do not really benefit people like them, but the majority (53%) disagree. One in five (20%) neither agree nor disagree, while 2% say they ‘don’t know’.

At a country level, the proportions that agree with this statement are highest in Poland and Romania (both 39%) and Italy (37%), and lowest in Sweden (5%), Ireland (7%), and Finland and Denmark (both 9%). It is worth noting that Romania and Bulgaria (34%) are the only countries where agreement is the dominant position, while in Poland the proportions that agree and disagree are the same (both 39%).

The largest share of respondents who agree science and technology do not really benefit people like them are observed in two non-EU countries: Montenegro (48%) and Kosovo (43%). By contrast, 6% of respondents in Iceland and Norway also agree. Disagreement is the majority view in Iceland (78%), Norway (79%) and Switzerland (66%), while in North Macedonia opinion is almost evenly divided (36% positive, 37% negative).

QA17.1 How strongly do you agree or disagree with the following statements?
Science and technology do not really benefit people like you (% - EU27)



The socio-demographic analysis shows no notable differences based on gender or age. It does, however, illustrate some other differences:

Respondents who completed education younger are the most likely to agree with the statement. For instance, 36% of those who finished education aged 15 or younger agree, compared to 18% of those who completed aged 20 or older.

The analysis shows managers (16%) are much less likely to agree than other occupation groups, in particular manual workers (31%). It also highlights that those who experience more financial difficulties are the most likely to agree: around one-third who experience financial difficulties from time to time (34%) or most

of the time (33%) agree, compared to 22% who rarely or never experience financial problems.

Perhaps unsurprisingly, respondents who think the impact of science and technology on society is negative are more likely to agree than those who think the influence is positive (39% vs 24%).

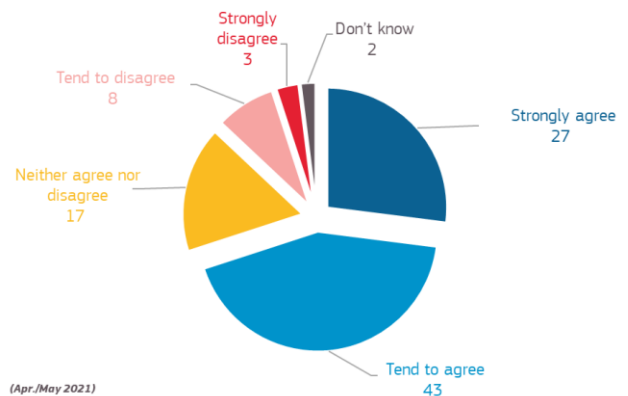
Respondents were asked how strongly they agreed or disagreed with the statement “*Science and technology could improve living conditions in less developed countries, but they mostly improve living conditions in well-off countries*”.

Seven in ten (70%) respondents agree with this statement, with 27% saying they ‘strongly agree’. Just over one in ten (11%) disagree, while 17% are neutral and 2% say they ‘don’t know’.

Echoing the EU-level results, a majority of respondents in every country also agrees that science and technology could improve living conditions in less developed countries, but they mostly improve living conditions in well-off countries. Proportions range from 82% of respondents in Portugal, 81% in Cyprus and 77% in Spain and Slovenia, to 58% in Finland, 60% in Estonia, and 61% in Romania. It is worth noting that in 20 countries at least one in five respondents ‘strongly agree’ with the statement.

Across non-EU countries, Albania (29%) is the only country where fewer than six in ten respondents agree, but agreement is still the majority position (vs 19% who disagree).

QA17.3 How strongly do you agree or disagree with the following statements?
Science and technology could improve living conditions in less developed countries, but they mostly improve living conditions in well-off countries (% - EU27)



The socio-demographic analysis reveals slight differences in opinion based on age, gender, educational level and financial situation.

In terms of occupation, unemployed respondents (75%) are the most likely to agree, particularly when compared to the self-employed (68%).

The further to the left a respondent places themselves on the political spectrum, the more likely they are to agree: 75% on the left do so, compared to 70% in the centre and 65% on the right.

The analysis also illustrates that respondents who think the influence of science and technology is positive are more likely to agree (71% vs 63% who think the influence is negative).

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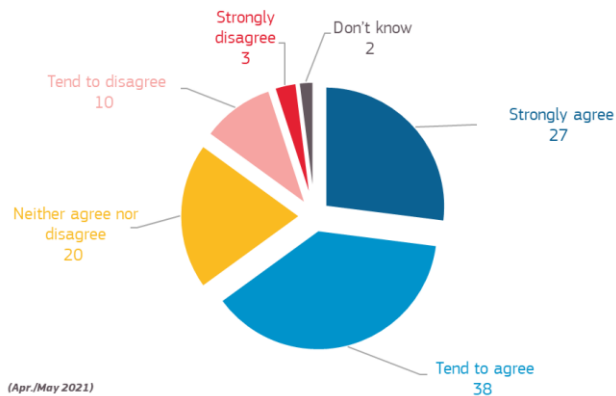
Respondents were asked how strongly they agreed or disagreed with the statement “Science and technology could help improve the environment but they mostly help companies make money”.

Almost two-thirds (65%) of respondents in the EU agree, with 27% saying they ‘strongly agree’. Just over one in ten (13%) disagree, while 20% are neutral and 2% say they ‘don’t know’.

In every EU country, respondents are most likely to agree with this statement, although proportions range from 78% in Cyprus and 74% in Spain and Slovenia to 44% in Denmark, 49% in the Netherlands and 51% in Finland. In 17 countries at least one in five respondents ‘strongly agree’.

In the non-EU countries, Albania (30%) is the only country where fewer than half of all respondents agree, but this still represents a majority (vs 19% who disagree).

QA17.4 How strongly do you agree or disagree with the following statements?
Science and technology could help improve the environment but they mostly help companies make money (% - EU27)



As with the other statements in this section, the socio-demographic analysis shows only slight differences in opinion based on gender or age. There are however some differences in other socio-demographic groupings:

There is a small difference based on education level, with those who finished education younger more likely to agree (68% vs 62% who finished aged 20+).

Managers (60%) are less likely to agree than other occupational groups, in particular the unemployed (68%).

The analysis also shows those who place themselves on the left (69%) or in the centre (65%) of the political spectrum are more likely to agree than those who place themselves on the right (59%).

Perhaps logically, respondents who are very interested (67%) or moderately interested (65%) in environmental problems and climate change are more likely to agree that science and technology could help improve the environment but mostly help companies make money than respondents who are not interested in environmental problems (58%).

Respondents were asked the extent to which they agree or disagree with three statements: “Science makes our ways of life change too fast”, “The applications of science can threaten human

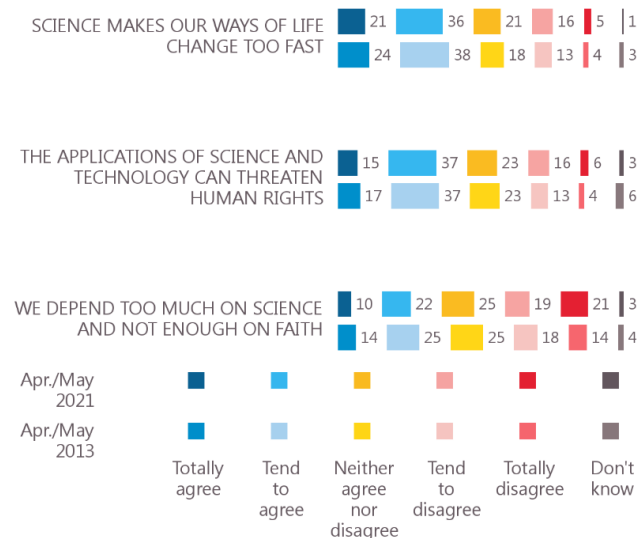
rights”, and “We depend too much on science and not enough on faith”. All three questions had been asked before, in 2013.

The majority (57%) of respondents in the EU agree that ‘science makes our ways of life change too fast’. Just over one in five (21%) disagree, while the same proportion is neutral and 1% say they don’t know. Respondents are now less likely to agree than they were in 2013 (-5 pp).

Just over half (52%) of respondents agree that ‘the applications of science and technology can threaten human rights’. Slightly more than one in five (22%) disagree, while 23% are neutral and 3% say they don’t know. There has been little change in agreement since 2013 (-2 pp), but the proportion that disagrees has increased (+ 5 pp).

A minority (32%) of respondents in the EU agree that ‘we depend too much on science and not enough on faith’. Four in ten (40%) disagree, 25% are neutral and 3% say they don’t know. The proportion of respondents who agree has declined by seven points since 2013, with agreement going from being the majority view in that survey to the minority view in 2021.

QA10 The following are some statements that people have made about science and technology. For each statement, please indicate to what extent you agree or disagree.
(% - EU)



In six countries at least half of respondents agree that we depend too much on science and not enough on faith, with the largest proportions seen in Cyprus (68%), Bulgaria (59%) and Greece (56%). At the other end of the scale 13% in Finland and Belgium and 15% in Sweden and Ireland think the same way.

In countries outside the EU there is a similar variation in opinion, with proportions ranging from 64% of respondents in Montenegro who agree to just 11% in Iceland.

In 24 countries, respondents are now less likely to agree we depend too much on science and not enough on faith than those in 2013. In 12 Member States the decline is at least ten points with the largest in Finland (-25 pp), Estonia (-23 pp) and Ireland (-22 pp). The exceptions are France, Cyprus and Romania where there have been minor increases in agreement (+2 pp each). In the

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United Kingdom the proportion that agrees has also declined significantly since 2013 (-23 pp).

The socio-demographic analysis shows no difference within the younger age groups, but does show that those aged 55+ (37%) are the most likely to agree, particularly compared to those aged 15-24 (27%). The earlier a respondent completed education, the more likely they are to agree that 'we depend too much on science and not enough on faith': 46% who completed education aged 15 or younger agree, compared to 25% of those aged 20 or older.

Opinions also vary by occupation group. For example, housepersons (40%) are the most likely to agree, particularly compared to managers (22%). Those with the least financial difficulties (20%) are less likely to agree than those who have more difficulties. (29% who never/almost never have difficulty paying bills vs 45% who often have difficulty paying bills). Finally, those who think the influence of science and technology is negative are more likely to agree with the statement than those who think the influence is positive (43% vs 31%), as are those who answer less than five answers correctly during the quiz (49%) compared to those who answer eight or more questions correctly (16%).

The proportion of respondents who agree that 'the applications of science and technology can threaten human rights' varies considerably between countries. Proportions range from 76% in Cyprus, to 34% in Estonia. However, it is worth noting that in all but two countries respondents are more likely to agree. The exceptions are Estonia and Denmark, where respondents are most likely to disagree – although in the case of Denmark this is by one percentage point. In the non-EU countries, respondents in Montenegro (66%) are the most likely to agree, particularly compared to those in Albania (28%). In spite of this range, agreement is still the majority view in each country.

Compared to 2013, respondents in 23 countries are now less likely to agree that 'the applications of science and technology can threaten human rights', with the largest declines seen in Estonia (-19 pp), Luxembourg (-18 pp) and Latvia (-15 pp). By contrast, respondents in Hungary (+8 pp), France (+7 pp) and Romania (+6 pp) are now more likely to agree. It is worth noting there have been large declines in the proportions that totally agree amongst respondents in Sweden (-11 pp), Malta and Slovenia (-10 pp each). Outside of the EU, the proportion of respondents in the UK that agrees has declined (-13 pp).

There are no notable differences in opinion based on gender, educational level or occupation, but the socio-demographic analysis does show that those aged 15-24 (45%) are the only age group where fewer than half of respondents agree. The analysis also highlights that the more financial difficulties a respondent experiences, the more likely they are to agree: 61% who experience the most difficulties do so, compared to 50% of those who experience the fewest difficulties. Finally, respondents who think the influence of science and technology is negative are more likely to agree than those who think the influence is positive (61% vs 50%).

Although the proportion of respondents who agree that 'science makes our ways of life change too fast' varies by 64 percentage

points across countries, agreement is the most common opinion in 24 countries, with the highest levels seen in Cyprus (94%), Greece (86%) and Spain (83%). By contrast, 30% of respondents in Ireland, 33% in Denmark and 35% in the Netherlands agree; in these three countries respondents are most likely to disagree with this statement.

Across non-EU countries agreement ranges from 81% of respondents in Turkey to 27% in the United Kingdom. Iceland and the United Kingdom are the only countries where respondents are more likely to disagree than to agree.

Since 2013, agreement that 'science makes our ways of life change too fast' has declined in 24 countries, with the largest drops seen in Estonia (-26 pp), Luxembourg (-24 pp) and Ireland (-21 pp). Overall, there are 14 countries where the decline has been at least 10 percentage points. In addition, there are nine countries where the proportion that 'totally agrees' has dropped by at least 10 points, with the largest decreases seen in Estonia (-19 pp), Malta (-18 pp) and Slovenia (-16 pp). The only increases in agreement are recorded in Spain (+5 pp) and Cyprus (+1 pp), while there has been no change in Bulgaria. Respondents in the United Kingdom are now much less likely to agree than they were in 2013 (-26 pp), and the proportion that 'totally agrees' has declined by 16 points.

The socio-demographic analysis regarding 'science makes our ways of life change too fast' shows little difference in opinion based on gender, but does highlight that:

The older the respondent, the more likely they are to agree. For example, 62% of the oldest respondents agree, compared to 49% of those aged 15-24. The earlier a respondent completed education, the more likely they are to agree. Almost seven in ten (69%) of those who completed education aged 15 or younger agree with the statement, compared to 52% of those who completed education aged 20 or older. Opinion also varies by occupation group, with manual workers the most likely to agree, particularly compared to managers (63% vs 47%). The analysis also shows that respondents who place themselves on the right (61%) or in the centre (58%) of the political spectrum are more likely to agree than those who place themselves on the left (52%). Finally, respondents who think the influence of science and technology is negative are more likely to agree (64%) compared to those who think the influence is positive (56%), as are those who answer five or less of the quiz questions correctly compared to those who get eight or more of the questions right (68% vs 42% respectively).

III. VIEWS ON THE GOVERNANCE OF SCIENCE AND TECHNOLOGY



1. Governance of science and technology

Respondents were asked which of the following two statements came closest to their point of view:

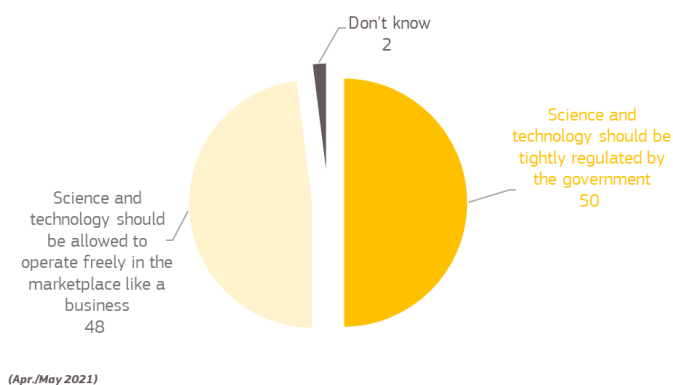
- “Science and technology should be tightly regulated by the government”;
- “Science and technology should be allowed to operate freely in the marketplace like a business”.

Opinion is divided on the regulation of science and technology. Half (50%) think science and technology should be tightly regulated by the government, while almost as many (48%) think it should be allowed to operate freely in the marketplace like a business. Just 2% say they don't know.

At a country level, the majority of respondents in 11 Member States say science and technology should be tightly regulated by the government, with the highest proportions in Italy (64%), Bulgaria and Spain (both 59%). In the other 16 countries the majority opinion is that science and technology should be allowed to operate freely in the marketplace like a business, with those in Czechia (81%), Estonia (79%) and Finland (78%) the most likely to think this way.

In all but three of the non-EU countries surveyed, the dominant opinion is that science and technology should be tightly regulated by the government, with this view most widely held in Albania (75%). The exceptions are Switzerland (58%), Turkey (58%) and Iceland (55%) where the majority prefers the free-market approach.

QA13B Below are a series of questions with two statements each. For each pair, please select the statement which comes closest to your point of view. Please select one (% - EU 27)



The socio-demographic analysis shows a few differences:

Women are slightly more likely to say that science and technology should be tightly regulated than operate freely in the market (51% vs 46%). By contrast, opinion is almost evenly divided for men.

Respondents aged 15-39 are most likely to say science and technology should be allowed to operate freely, while those aged 40 and older are most likely to favour tight regulation by

government. The gap is widest for respondents aged 15-24, with 55% in favour of a free-market approach and 43% in favour of tight government regulation.

The longer a respondent remained in education, the more likely they are to be in favour of a free-market approach, and for those who completed education aged 20 or older the free-market approach is the dominant opinion (53% vs 45% for tight regulation). By contrast, 63% of those who completed education aged 15 or younger are in favour of tight government regulation and 33% are in favour of a free-market approach.

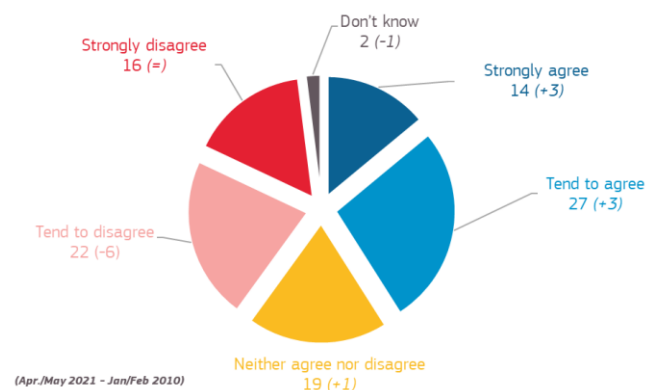
Across occupational groups, students, managers and the self-employed are most likely to favour a free-market approach, while housepersons, unemployed people and retired persons are most likely to favour tight government regulation.

The analysis also shows that those who experience greater financial difficulty are more likely to favour tight government regulation.

Finally, those who think the influence of science and technology is negative are more likely to favour tight government regulation (54% vs 43% for the free market approach). Opinion is evenly split amongst those who think the influence is positive (both 49%).

Respondents were also asked the extent to which they agreed or disagreed that “There should be no limit to what science is allowed to investigate.”

QA9.8 The following are some statements that people have made about science or technology. For each statement, please indicate to what extent you agree or disagree. There should be no limit to what science is allowed to investigate (% - EU27)



The results reveal that there is no clear consensus amongst respondents. Just over four in ten (41%) agree with this statement, but almost as many (38%) disagree. In addition, the proportions that strongly agree (14%) and strongly disagree (16%) are similar. Almost one in five (19%) say they neither agree nor disagree.

Analysis of the trend since 2010 shows that while opinions are still divided, agreement has gone from being the minority opinion in 2010 to being the majority view in 2021 (+6 pp), although the majority is slim.

There is wide variation across Member States. The proportion of respondents who agree there should be no limit to what science is allowed to investigate is highest in Finland (68%), Estonia (64%),

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Hungary and Portugal (both 62%), and lowest in Germany (25%), and Austria and the Netherlands (both 31%). Overall, there are 17 countries where respondents are most likely to agree, and 10 where they are most likely to disagree.

Across the non-EU countries studied, agreement ranges from 74% in Turkey to 20% in Albania. Disagreement is the majority position in Albania, Switzerland and Iceland, while in Serbia opinion is divided (36% agree, 36% disagree).

Compared to 2010, respondents in 20 Member States are now more likely to agree there should be no limit to what science is allowed to investigate, with the largest increases in Finland (+39 pp), Portugal (+25 pp) and Malta and Poland (+18 pp each). In Ireland, Greece, Cyprus, Poland and Finland agreement has gone from being the minority position in 2010, to the majority position in 2021.

The proportion of respondents who 'strongly agree' with this statement has increased most in Finland (+20 pp) and Cyprus (+10 pp) and has declined most in Latvia (-12 pp).

Outside the EU, respondents in Norway (+23 pp) and Turkey (+21 pp) are now much more likely to agree, while those in Switzerland (-6 pp) are slightly less likely to do so.

Socio-demographic analysis illustrates that men are more likely than women to agree there should be no limit to what science is allowed to investigate (43% vs 38%).

In addition, the younger the respondent, the more likely they are to agree: 46% of 15-24 year olds do so, compared to 37% of those aged 55 and older.

Respondents who completed education aged 15 or younger (34%) are less likely to agree than those who completed aged 16 or above and the same pattern applies comparing those who live in towns with those living in rural villages. Students and other white-collar workers (both 46%) are the most likely to agree, compared to retired persons (35%).

Not surprisingly, those who think the influence of science and technology is positive are more likely to agree than those who think the influence is negative (42% vs 32%).

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2. Public access to research results

Respondents were asked the extent to which they agreed or disagreed that “The results of publicly funded research should be made available online free of charge”.

A large majority (79%) agree, with 43% saying they ‘strongly agree’. Just 5% disagree, while 13% are neutral.

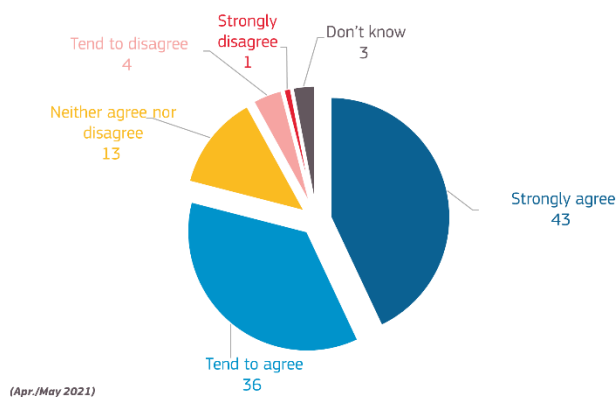
At a country level more than six in ten respondents in every Member State agree that the results of publicly funded research should be freely available online. Proportions range from 96% of respondents in Portugal to 62% in Romania. In 12 countries more than half of all respondents ‘strongly agree’, with the largest proportions in Cyprus (69%), Portugal (68%), Ireland and Sweden (both 58%).

Austria is the only country where at least one in ten respondents disagree (11%), while the highest proportions of neutral responses (neither agree nor disagree) are observed in Romania (25%) and Hungary (24%).

In all but one non-EU country more than six in ten respondents agree, with the highest proportions in the United Kingdom and Turkey (both 90%). The exception is Albania, where just 30% agree. However, in each country respondents are more likely to agree than to disagree.

The socio-demographic analysis shows men agreeing with the statement slightly more than women. In addition, those aged 15-54 are more likely to agree than those aged 55 and older. For example, 83% of 15-24 year olds agree, compared to 73% of those aged 55 and over.

QA9.5 The following are some statements that people have made about science or technology. For each statement, please indicate to what extent you agree or disagree.
Artificial intelligence and automation will create more jobs than they will eliminate (% - EU27)



The longer a respondent remained in education, the more likely they are to agree: 85% who completed education aged 20 and older agree, compared to 62% of those aged 15 or younger.

The analysis also shows managers (87%) are the most likely to agree, particularly compared to housepersons and retired persons (both 71%).

Respondents who experience the fewest financial difficulties (81%) are more likely to agree than those who experiences

difficulties from time to time or most of the time (73% and 74% respectively).

Finally, the analysis shows respondents who think the influence of science and technology is positive are much more likely to agree that the results of publicly funded research should be made available online free of charge than those who think the influence is negative (82% vs 64%).

IV. VIEWS OF SCIENTISTS



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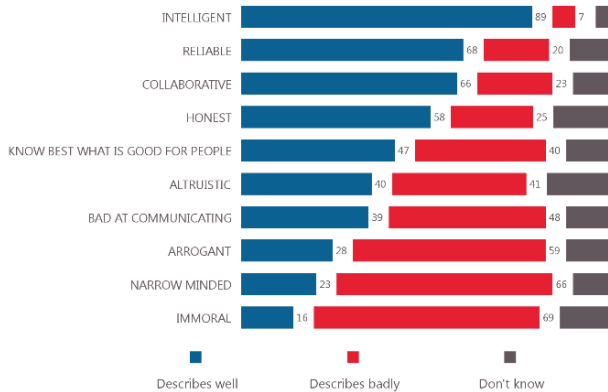
1. Characteristics of scientists

1.1 Characteristics attributed to scientists

Presented with 10 words or phrases describing characteristics that scientists could have, Europeans are more likely to associate scientists with positive characteristics than negative ones.

The characteristic most frequently associated with scientists is 'intelligent' (89% say this describes scientists well). More than half of respondents say that 'reliable' (68%), 'collaborative' (66%) and 'honest' (58%) are characteristics that describe scientists well. 'Altruistic' is the only positive characteristic where respondents are more likely to say this describes scientists 'badly' than to say it describes them well' (41% vs 40%).

QA12a The following is a list of characteristics that can be associated with scientists today. For each characteristic, indicate if you think it describes scientists well or describes them badly (% - EU27)



The negative characteristics most commonly associated with scientists is 'bad at communicating' (39% say this describes scientists well), followed by arrogant (28%), narrow minded (23%), and immoral (16%). In each case, respondents are more likely to say the negative characteristic describes scientists 'badly' than say it describes them 'well'.

More than three-quarters of respondents in every EU Member State say that *intelligent* describes scientists well. Almost all respondents give this answer in Ireland (98%), Czechia (97%), the Netherlands, Luxembourg and Portugal (all 96%). The lowest proportions are found in Romania (77%) and Poland (79%). In all other Member States, no more than one in ten respondents says that 'intelligent' describes scientists badly. Looking at the non-EU countries surveyed, respondents in Albania (57%) are much less likely to say that 'intelligent' describes scientists well, particularly when compared with the UK (97%).

In all 27 EU Member States, more than half of respondents think that *reliable* describes scientists well. Respondents are most likely to say this in Portugal (83%), Ireland (81%), Sweden and Finland (both 80%), while the proportion is lowest in Germany and Cyprus (both 59%), and Austria and France (both 60%). Looking at the 11 other countries surveyed, respondents in the UK, Turkey and Iceland (all 85%) are most likely to say that 'reliable' describes scientists well, while those in Switzerland and Bosnia and Herzegovina (both 29%) are most likely to say it describes them badly.

In most EU Member States, at least two-thirds of respondents say that *collaborative* describes scientists well. The proportion is highest in Czechia (83%), Ireland (82%), Slovakia (81%) and Portugal (79%). However, there are some Member States where respondents are less likely to describe scientists as 'collaborative'. In particular, only 45% of respondents in Austria and 51% in Romania say this describes scientists well, and 36% in both countries say that 'collaborative' describes scientists badly. Looking at the 11 other countries surveyed, respondents in the UK (83%) are most likely to say that 'collaborative' describes scientists well, while those in Switzerland (45%) are most likely to say it describes them badly.

In six EU Member States, at least three-quarters of respondents think that *honest* describes scientists well: Sweden (80%), Ireland (78%), Portugal (77%), Denmark and Finland (both 76%), and Estonia (75%). By contrast, less than half of respondents take this view in Germany (46%), Austria (47%), Cyprus (48%) and Bulgaria (49%). More than a third of respondents in Bulgaria (39%) say they 'don't know', and this also applies to around a quarter of respondents in Malta (26%), Germany (25%), Austria (24%) and Cyprus (23%). The proportion is much lower (1% or less) in several Member States. Looking at the 11 other countries surveyed, respondents in Turkey and Iceland (both 82%) are the most likely to say that 'honest' describes scientists well, while those in Switzerland (38%) are most likely to say it describes them badly.

There is wide variation by Member State in the proportions that say '*know best what is good for people*' describes scientists well. It is the majority view in 15 countries, led by Bulgaria, Greece, Cyprus (all 68%) and Spain (67%). In the other 12 EU Member States, a majority thinks that this is a bad description of scientists; respondents are most likely to take this view in Luxembourg (63%), Czechia (61%) and the Netherlands (59%). Looking at the 11 other countries surveyed, the proportion that say 'know best what is good for people' describes scientists well ranges from 78% in Turkey to 29% in Switzerland.

In 16 EU Member States, a majority of respondents say that *altruistic* describes scientists well. The proportion is highest in Portugal (58%), Estonia (57%), Ireland (56%) and Croatia (55%). In 10 Member States, the majority view is that 'altruistic' describes scientists badly. More than half of respondents take this view in the Netherlands (61%), Austria (54%), Latvia and Germany (53%). Looking at the 11 other countries surveyed, respondents in Turkey (87%) are most likely to say that 'altruistic' describes scientists well, while those in Switzerland (62%) are most likely to say it describes them badly.

In four EU Member States, a majority of respondents say that '*bad at communicating*' describes scientists well: Luxembourg (52%), Belgium (50%), Slovenia (48% well, 46% badly) and France (47% well, 37% badly). In the other 23 EU Member States, the prevailing view is that it describes scientists badly, and this view is held most strongly by respondents in Estonia (67%), Hungary (66%), Malta (63%), Portugal (61%) and Croatia (60%). 'Don't know' responses account for a third of respondents in Bulgaria (34%) but less than fifth in other Member States. Looking at the 11 other countries surveyed, the proportion that say 'bad at communicating' describes scientists well ranges from 47% in Switzerland to 21% in Albania.

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The proportion of respondents who describe scientists as *arrogant* varies considerably by Member State, from 50% in Greece to 10% in Hungary. Overall, there are three countries where a majority think 'arrogant' describes scientists well: Greece (50%), Poland (46% well, 38% badly) and Cyprus (41% well, 39% badly). In the remaining 24 Member States, a majority thinks that 'arrogant' is a bad description for scientists. The highest proportions are seen in Estonia (86%), Czechia (81%), Portugal (80%) and Sweden (79%). At least a fifth of respondents say they 'don't know' in Bulgaria (30%), and Cyprus and Germany (both 20%), while very few respondents give a 'don't know' answer in several Member States. Looking at the 11 other countries surveyed, respondents in Bosnia and Herzegovina (32%) are the most likely to say that 'arrogant' describes scientists well, while those in the UK and Iceland (both 77%) are most likely to say it describes them badly.

Respondents in Slovenia (48%) are by far the most likely to say that '*narrow minded*' describes scientists well. In the other EU Member States no more than a third of respondents take this view, with the highest proportions in Austria (33%), and Poland and Luxembourg (both 30%). Respondents are least likely to think 'narrow minded' is a good description of scientists in Malta (10%), the Netherlands (13%) and Bulgaria (14%). In every country except Slovenia, the majority of respondents think that 'narrow minded' describes scientists badly, led by those in Portugal (85%), Finland (83%) and Estonia (82%). Looking at the 11 other countries surveyed, respondents in Switzerland (28%) are the most likely to say that 'narrow minded' describes scientists well, while those in Turkey (81%) are most likely to say it describes them badly.

In every EU Member State, the majority view is that *immoral* describes scientists badly, and more than eight in ten respondents hold this view in Estonia (89%), Portugal and Sweden (both 88%), Ireland (86%), Czechia (85%), Belgium and Finland (both 83%), and Denmark (81%). Respondents are most likely to say that 'immoral' describes scientists well in Slovenia (32%), Malta (31%), Poland (27%) and Romania (25%). Looking at the 11 other countries surveyed, respondents in the Republic of North Macedonia (23%) are the most likely to say that 'immoral' describes scientists well, while respondents in Iceland are least likely to say this (8%).

In the socio-demographic analysis, a few interesting patterns can be observed: younger respondents are more likely than older respondents to have a positive view of scientists. For example, 74% of 15-24 year olds say that 'collaborative' describes scientists well, compared with 62% of those aged 55 or over.

More highly educated respondents are also more likely to have a positive view of scientists. For example, 62% of those who left education at the age of 20 or above say that 'honest' describes scientists well, compared with 51% of those who left education at the age of 15 or younger.

Respondents who have difficulties paying bills most of the time have a less positive perception of scientists, compared with respondents who rarely or never have difficulties. For example, 26% of those who have difficulties most of the time say that 'immoral' describes scientists well, compared with 14% of those who rarely or never have difficulties.

Attitudes also seem to be related to knowledge about science. For example, 79% of respondents who answered more than eight questions correctly say that 'reliable' describes scientists well, compared with 58% of those who answered fewer than five questions correctly. The views of respondents who have worked in research, science or innovative technology development are mostly similar to other respondents. However, perceptions tend to be more positive if both they and a family member have worked in one of these areas. Among these respondents, 98% say that 'intelligent' describes scientists well, compared with 89% of respondents overall.

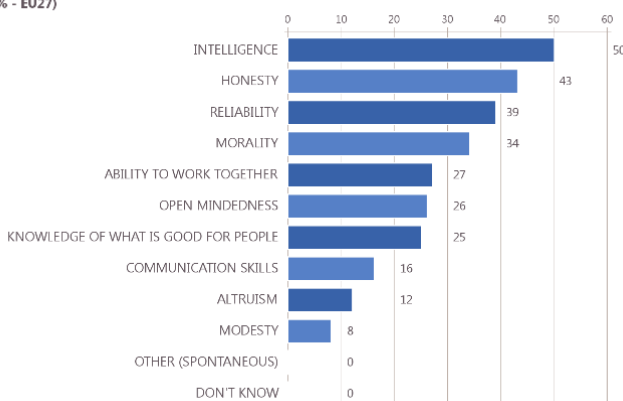
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1.2 Characteristics desired in scientists

Europeans are most likely to say that 'intelligence' is a quality that scientists should have (50%), followed by 'honesty' (43%), 'reliability' (39%) and 'morality' (34%), all of which are chosen by at least one in three respondents. Around one in four Europeans say that scientists should have the 'ability to work together' (27%), 'open mindedness' (26%) and 'knowledge of what is good for people' (25%). Other qualities are seen as less important: communication skills (mentioned by 16%), altruism (12%) and modesty (8%).

In general, these priorities are consistent with the characteristics that are associated with scientists. For example, 'intelligence' is seen as the most important quality for scientists to have, and is also the characteristic that is most frequently associated with them. This indicates that Europeans hold a generally positive image of scientists, and in broad terms believe that they have positive characteristics that are in line with the things that are important.

QA12b Please choose the three qualities that you think scientists should have: (MAX. 3 ANSWERS)
(% - EU27)



The findings for EU Member States show some variations. Respondents in Czechia (78%) and Portugal (66%) are the most likely to say that *intelligence* is a quality that scientists should have, while this is least likely to be mentioned by respondents in Latvia (34%), Greece (35%) and Hungary (36%). Latvia and Greece are the only two Member States where 'intelligence' is not one of the top three answers.

Honesty is mentioned most frequently by respondents in France and Luxembourg (both 54%), Lithuania (53%) and Ireland (52%) and least frequently by those in Czechia (14%) and Romania (21%). There are only four Member States where 'honesty' is not one of the top three responses: Czechia, Estonia, Croatia and Romania.

Respondents in the Netherlands are most likely to say that *reliability* is a quality that scientists should have (61%), followed by those in Hungary (54%) and Greece (51%). It is least likely to be mentioned by respondents in Ireland (15%) and Luxembourg (24%).

Morality is chosen most frequently by respondents in Greece (57%), Czechia (56%) and Denmark (53%), while the proportion is lowest in Bulgaria (22%) and Spain (23%).

Respondents in Czechia (47%) and Estonia (44%) are most likely to say the '*ability to work together*' is a desired quality for scientists, while this is least likely to be chosen by those in Greece and Cyprus (both 15%).

'*Open mindedness*' is particularly valued by respondents in Latvia (51%) and Ireland (42%), with respondents least likely to choose this quality in Croatia (9%) and Bulgaria (14%).

Respondents in Bulgaria (54%) and Slovenia (46%) are most likely to say that '*knowledge of what is good for people*' is a desired quality for scientists, while this is least likely to be mentioned by those in the Netherlands (13%) and Luxembourg (14%).

'*Communication skills*' are mentioned most frequently by respondents in Germany (25%) and Ireland (23%), and least frequently by those in Greece (7%) and Estonia (9%).

Altruism is a quality that is most highly valued for scientists in the Netherlands (33%) and Estonia (29%), while respondents in Germany (5%) are least likely to mention it.

Finally, *modesty* is the quality that ranks lowest in importance in most EU Member States; it is most likely to be chosen by respondents in Sweden (19%) and Romania (17%).

In the socio-demographic analysis, the main differences are by level of education: for instance, respondents who finished education at the age of 20 or above are more likely to say that scientists should have the quality of 'open mindedness' (30%) compared to those who left education at the age of 15 or below (20%). Respondents who answered eight or more answers correctly in the 'quiz' (QA20) are more likely to value certain qualities, such as 'intelligence' (57% compared with 44% of those who answered less than five questions correctly) and the 'ability to work together' (35% vs 21%). However, they are less likely to value qualities such as 'reliability' (34% vs 39%), 'honesty' (39% vs 45%) and 'knowledge of what is good for people' (18% vs 32%).

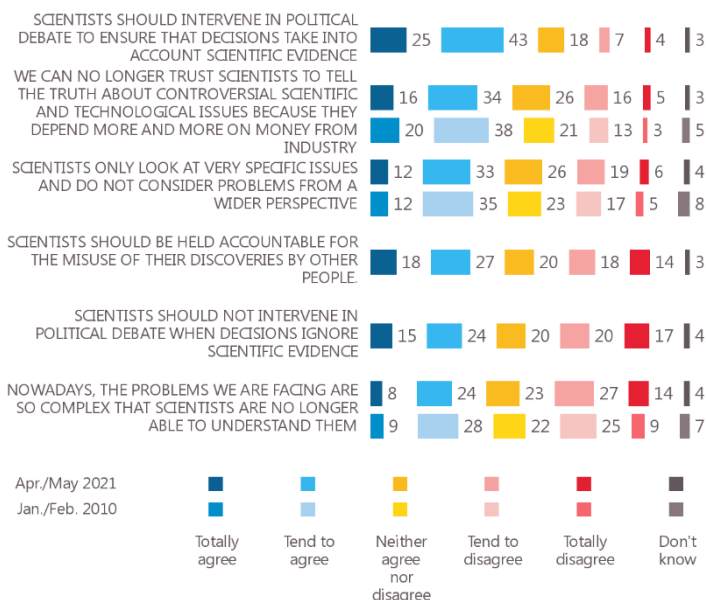
2. Scientists and society

This section looks at citizens' attitudes towards scientists, in terms of their role in decision making, their position in society and their interactions with the public.

In order to examine the issue of scientists intervening in political debate, the sample was randomly divided into two, with one-half asked a 'positive' statement and the other half a 'negative' statement. On balance, this shows a preference for scientists intervening in political debate: two-thirds agree (68%) that "scientists should intervene in political debate to ensure that decisions take into account scientific evidence", with just 11% disagreeing. With the alternative wording, that "scientists should not intervene in political debate when decisions ignore scientific evidence", approximately equal proportions agree (39%) and disagree (37%).

Europeans express mixed views about the credibility of scientists. Half of respondents (50%) agree that "we can no longer trust scientists to tell the truth about controversial scientific and technological issues because they depend more and more on money from industry", with 21% disagreeing. However, agreement has fallen by 8 percentage points since 2010²⁸ and the proportion that disagrees has increased by 5 percentage points²⁹.

QA11 To what extent do you agree with the following statements regarding scientists today?
 (% - EU)



Just under half of respondents (45%) agree that "scientists only look at very specific issues and do not consider problems from a wider perspective", while 25% disagree. In the EU overall, there has been little change since 2010 in the proportion agreeing (-2 pp) and disagreeing (+3 pp)³⁰.

Almost half of Europeans (45%) agree that "scientists should be held accountable for the misuse of their discoveries by other people", while a third (32%) disagree. In the EU overall, there has been an increase in agreement since 2005 (+6 pp) and decrease in disagreement (-6 pp)³¹.

A third (32%) of respondents agree that "nowadays, the problems we are facing are so complex that scientists are no longer able to understand them", while a larger proportion (41%) disagrees. In the EU overall, there has been a decrease in agreement since 2010 (-5 pp), while there has been an increase in the proportion that disagree (+7 pp).

In all EU Member States, a majority of respondents agrees that "scientists should intervene in political debate to ensure that decisions take into account scientific evidence". The proportion that agrees is highest in Estonia (85%), Belgium (81%), Ireland and Portugal (both 78%), while agreement is lowest in Hungary (43%). In the 11 other countries covered by the survey, agreement with the statement ranges from 73% in Switzerland to 36% in Albania.

In the EU overall, half of respondents (50%) agree that "we can no longer trust scientists to tell the truth about controversial scientific and technological issues because they depend more and more on money from industry". In all but one of the 27 EU Member States, a majority of respondents agree with the statement. The exception is Ireland, where 35% agree and 36% disagree. Respondents are most likely to agree with the statement in Cyprus (71%) and Slovenia (62%), while agreement is lowest in Ireland (35%), Malta (37%) and Czechia (39%).

There has been a fall in agreement with this statement in most EU Member States since 2010, the largest in Finland (-21 pp), Denmark (-18 pp), Germany (-18 pp) and Sweden (-17 pp). The only exceptions are Portugal, where agreement has increased slightly (+2 pp), and Spain and Bulgaria where there has been no change. Looking at the 11 other countries surveyed in 2021, agreement ranges from 59% in the Republic of North Macedonia to 27% in the UK. There have also been large decreases (in the countries surveyed) since 2010, the largest being in Iceland (-24 pp), the UK and Norway (both -22 pp).

In 26 EU Member States a majority of respondents agree that "scientists only look at very specific issues and do not consider problems from a wider perspective". The exception is Estonia, where 30% agree and 43% disagree. Respondents are most likely to agree with the statement in Cyprus (59%) and Slovenia (57%), while the proportion that disagrees is highest in Estonia (43%) and Luxembourg (36%). In the 11 other countries surveyed, respondents in Kosovo are most likely to agree that scientists only look at very specific issues (56%), especially compared with those in Iceland (18%).

²⁸ In 2010 the United Kingdom was still part of the European Union but Croatia had not yet joined. The 2010 total therefore refers to an "EU 27" that includes the UK but not Croatia.

²⁹ This analysis is based on the 28 countries that were part of the EU at either of the two time points (January-February 2010 and April-May 2021).

³⁰ This analysis is based on the 28 countries that were part of the EU at either of the two time points (January-February 2010 and April-May 2021).

³¹ This analysis is based on the 28 countries that were part of the EU at either of the two time points (January-February 2010 and April-May 2021).

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There have been some large decreases in agreement in EU Member States since 2010, the largest being in Finland (-21 pp), Sweden (-19 pp) and Denmark (-17 pp). The largest increases in agreement can be seen in Cyprus (+10 pp) and Hungary (+9 pp). Looking at the 11 other countries surveyed, the largest increase in agreement can be seen in Turkey (+9 pp), while Iceland shows the largest decrease (-24 pp).

In 16 Member States, a majority of respondents agree that “scientists should be held accountable for the misuse of their discoveries by other people”. Levels of agreement are highest in Cyprus (77%), Greece (67%), Slovenia (64%) and Bulgaria (63%). In the 11 other Member States, a majority of respondents disagree with the statement, with disagreement highest in Estonia, Finland (both 60%), Sweden (58%) and Portugal (54%). In the 11 other countries surveyed, respondents in the Republic of North Macedonia are most likely to agree that ‘scientists should be held accountable for the misuse of their discoveries by other people’ (69%), while agreement is lowest in Iceland (11%).

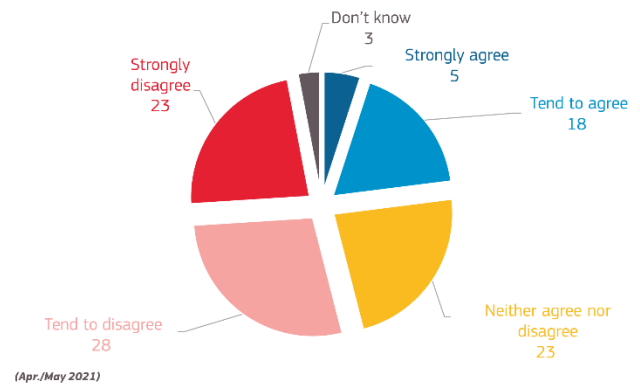
There have been some large increases in agreement in individual EU Member States since 2005, the largest being in Slovenia (+27 pp), Bulgaria (+26 pp), and Hungary (+25 pp). The largest falls in agreement can be seen in Estonia (-18 pp), Sweden (-15 pp) and Portugal (-12 pp). Looking at the 11 other countries surveyed (and specifically those also included in the 2005 survey), the largest shift in agreement can be seen in Norway (-17 pp).

In 11 EU Member States, a majority of respondents agree that “nowadays, the problems we are facing are so complex that scientists are no longer able to understand them”. Agreement is highest in Cyprus (46%), and Italy and Spain (both 44%). In the other 16 Member States, respondents are more likely to disagree than agree with the statement. Respondents are most likely to disagree in Estonia (67%) and Ireland (66%). In the 11 other countries covered by the survey, there is wide variation in levels of agreement, from 55% in Kosovo to 8% in Iceland.

There has been a fall in agreement in most EU Member States since 2010, the largest being in Portugal (-27 pp). The largest increase in agreement can be found in Italy (+7 pp). In the 11 other countries surveyed (specifically those included in the 2010 survey), the largest shift in agreement can be seen in the UK (-22 pp).

Around a quarter of Europeans (23%) agree that “scientists spend sufficient time meeting people like me to explain their work”, with 5% saying they ‘strongly agree’ and 18% that they ‘tend to agree’. Half of respondents (51%) disagree, including 23% who ‘strongly disagree’. In all 27 EU Member States, a majority of respondents disagree with the statement. Respondents are most likely to disagree in Germany (66%), Greece (62%) and France (61%), and in these three countries around a third of respondents ‘strongly disagree’ (36%, 32% and 32% respectively). There are only two Member States where more than a third of respondents agree with the statement: Poland (36%) and Hungary (35%). In the 11 other countries there is a wide variation in agreement, with a majority agreeing in Montenegro (46%), and just 11% agreeing in the UK.

QA9.3 The following are some statements that people have made about science or technology. For each statement, please indicate to what extent you agree or disagree. **Scientists spend sufficient time meeting people like me to explain their work** (% - EU27)



In general, there are some consistent socio-demographic variations that apply to respondents' perceptions of scientists:

More highly educated respondents are less likely to agree that we can no longer trust scientists, that scientists look only at very specific issues, and that scientists should be held accountable for the misuse of their discoveries.

In terms of socio-professional groups, perceptions of scientists are consistently the most positive among managers and students. Manual workers (53%), retired people (52%) and housepersons (51%) are also more likely to agree that ‘scientists have power that makes them dangerous because of their knowledge’, while fewer managers (35%) and students (38%) agree with this.

For most QA11 statements, young people are less likely to agree than older respondents. For example, 41% of 15-24 year olds agree that ‘we can no longer trust scientists to tell the truth about controversial scientific and technological issues because they depend more and more on money from industry’ – lower than the proportion among those aged 55 or over (54%). On the other hand, older respondents are more likely than younger respondents to agree that ‘because of their knowledge, scientists have a power that makes them dangerous’ (50% of those aged 55 or over, compared with 40% of those aged 15-24).

Perceptions are also related to scientific knowledge. Respondents who answered more than eight statements correctly in the quiz are less likely to agree with the all statements (except for the one about that says scientists should intervene in political decisions) than those who answered less than five questions correctly. Among respondents who answered more than eight out of eleven statements correctly, 19% agree that ‘scientists spend sufficient time meeting people like me to explain their work’ compared to 27% of those who answered fewer than five correctly.

Generally, agreement with the statements is higher among respondents who describe themselves as ‘quite or very spiritual or religious’. For example, 55% of those who say they are quite or very spiritual or religious agree that scientists have a power that is dangerous compared to 39% of those who are not very or not spiritual or religious.

V. CITIZENS' ENGAGEMENT IN SCIENCE AND TECHNOLOGY



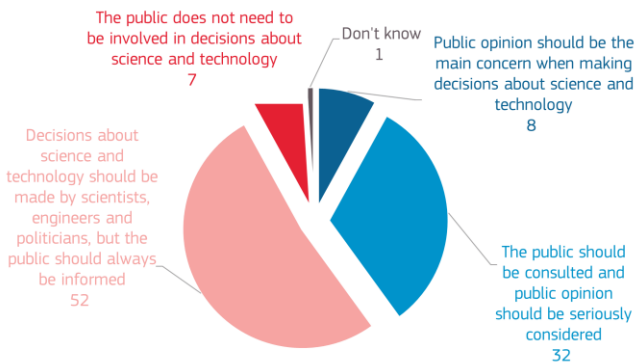
Special Eurobarometer 516
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1. Desired public involvement in decisions about science and technology

This section examines citizens' views on the involvement of the general public in making decisions about science and technology.

Four in ten Europeans (40%) think that public opinion should be taken into account in decision making about science and technology. Specifically, 8% say that 'public opinion should be the main concern when making decisions about science and technology', while 32% that 'the public should be consulted and public opinion should be seriously considered'.

QA7 What level of public involvement do you think is appropriate when it comes to decisions about science and technology? (% - EU27)



(Apr./May 2021)

The most popular option is that 'decisions about science and technology should be made by scientists, engineers and politicians, but the public should always be informed' (52%), while 7% think that 'the public does not need to be involved in decisions about science and technology'.

In three EU Member States, a majority of respondents support public involvement in decision making (saying either that public opinion should be the main concern or at least seriously considered): Romania (55%), and Austria and France (both 52%).

In the remaining 24 Member States, a majority oppose public involvement in decision making about science and technology, saying either that 'decisions about science and technology should be made by scientists, engineers and politicians, but the public should always be informed' or that 'the public does not need to be involved in decisions about science and technology'.

Looking at the non-EU countries surveyed, respondents in Switzerland (50%) are most likely to support public involvement in decision making, while the proportion of respondents who disagree that the public should be involved is highest in Kosovo (77%).

Attitudes about public involvement in science and technology decision making are generally consistent across socio-demographic groups. There is a slight difference by level of education, with those who left education older being more inclined to oppose public involvement. Specifically, 62% of those who left education at the age of 20 or above are opposed to public

involvement, compared to 55% of those who left education at the age of 15 or below.

Respondents who have difficulties paying bills most of the time are more likely to support public involvement in decision making (saying either that public opinion should be the main concern or at least seriously considered): 45% compared with 38% of those who rarely or never have difficulties paying bills.

Respondents who think science and technology has a positive influence on society are more likely to oppose public involvement (63% compared with 40% of those who say it has a negative influence).

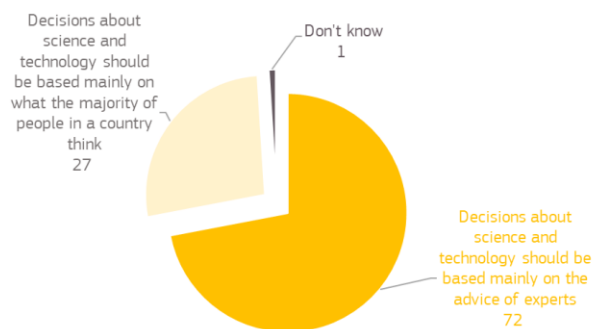
Attitudes are also related to knowledge about science. Respondents who answered eight or more questions in the quiz (QA20) correctly are more likely to disagree that the public should be involved (64%) than those who answered fewer than five quiz questions correctly (53%).

More than seven in ten Europeans (72%) hold the view that 'decisions about science and technology should be based mainly on the advice of experts', while 27% hold the view that 'decisions about science and technology should be based mainly on what the majority of people in a country think'.

In every EU Member State, the prevailing view is that 'decisions about science and technology should be based mainly on the advice of experts'. Respondents are most likely to hold this view in Czechia (92%), Estonia (90%), Finland (89%) and Malta (87%). The alternative viewpoint, that 'decisions about science and technology should be based mainly on what the majority of people in a country think', is most prevalent in Austria and Romania (both 38%), and Poland (36%).

Looking at the non-EU countries surveyed, respondents in the UK (87%) and Iceland (86%) are most likely to say that 'decisions about science and technology should be based mainly on the advice of experts', while those in the Republic of North Macedonia, Kosovo (both 36%) and Bosnia and Herzegovina (35%) are the most likely to say that decisions should be based mainly on what the majority of people in a country think.

QA13A Below are a series of questions with two statements each. For each pair, please select the statement which comes closest to your point of view. Please select one (% - EU 27)



(Apr./May 2021)

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In the socio-demographic analysis, results are mostly consistent by gender and age, but there are differences in some other groupings:

Respondents who left education at the age of 20 or above are more likely to say that 'decisions about science and technology should be based mainly on the advice of experts' (78%), compared with those who left education at age 16-19 (67%) or by the age of 15 (69%).

In terms of socio-professional groups, managers are most likely to think that decisions should be based mainly on the advice of experts (80%), while the proportion is lowest among manual workers (67%).

Respondents who never or almost never have difficulties paying bills are more inclined to think that 'decisions about science and technology should be based mainly on the advice of experts' (75%) compared with those who have difficulties most of the time (64%) or from time to time (65%).

The view that decisions should be based mainly on the advice of experts is more common among respondents who have an involvement in - or good knowledge of - science and technology. Indeed, those who say they are interested in scientific discoveries (77% compared with 62% of those who are not interested) and those who think science and technology has a positive influence on society (74% compared with 54% of those who think it has a negative influence) are more likely to say that decisions should be based mainly on the experts' advice.

Attitudes are also related to knowledge about science. Respondents who answered eight or more questions correctly in the quiz are more likely to think that decisions should be based mainly on the advice of experts (83%) than those who answered fewer than five questions correctly (60%).

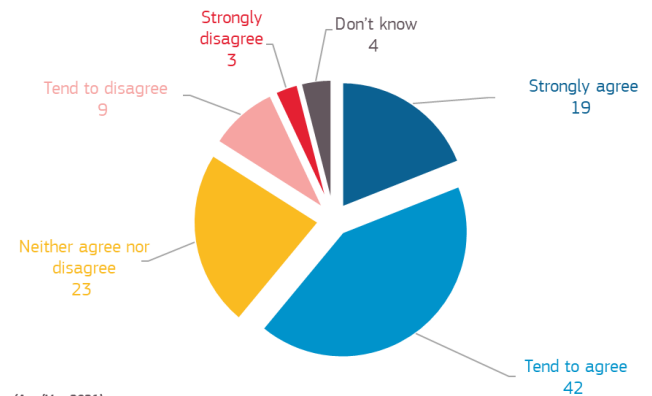
Among respondents who have worked in research, science or innovative technology development, 77% to think that decisions should be based mainly on the advice of experts, and this is higher still (83%) where both the respondent and a family member have worked in one of these areas. It is lower (71%) among respondents with no personal or family connection with this type of work.

Six in ten Europeans (61%) agree that "involving non-scientists in research and technological development ensures that science and technology respond to the needs, values and expectations of society", with 19% strongly agreeing. By contrast, 12% disagree with the statement, with 3% expressing strong disagreement.

In all 27 EU Member States, a majority of respondents agree with the statement. Agreement is highest in Ireland and Finland (both 70%), and Cyprus (69%), while it is lowest in Hungary (48%), and Sweden and Romania (both 51%).

Looking at the non-EU countries surveyed, respondents are most likely to agree with the statement in Montenegro (73%), while agreement is lowest in Albania (28%).

QA17.7 How strongly do you agree or disagree with the following statements?
Involving non-scientists in research and technological development ensures that science and technology respond to the needs, values and expectations of society (% - EU27)



The main difference in the socio-demographic analysis is by level of education:

More highly educated respondents (those who finished education at the age of 20 or above) are more likely to agree that 'involving non-scientists in research and technological development ensures that science and technology respond to the needs, values and expectations of society' (67% compared with 54% of those who left education by the age of 15).

Agreement is higher among respondents aged 25-39 and 40-54 (both 64%) than among those aged 15-24 (59%) or aged 55 or over (58%).

The view that non-scientists should be involved in research and technological development is more prevalent among respondents who say they are interested in scientific discoveries (66% compared with 52% of those who are not interested) and those who think science and technology has a positive influence on society (64% compared with 49% of those who think it has a negative influence).

Agreement is also higher in those who answered eight or more questions in the quiz correctly (68%) than those who answered fewer than five questions correctly (51%).

2. Citizens' engagement with science and technology

This section looks at public engagement with science and technology, focusing on the ways that people currently engage, how they might engage in the future, and their barriers to engagement.

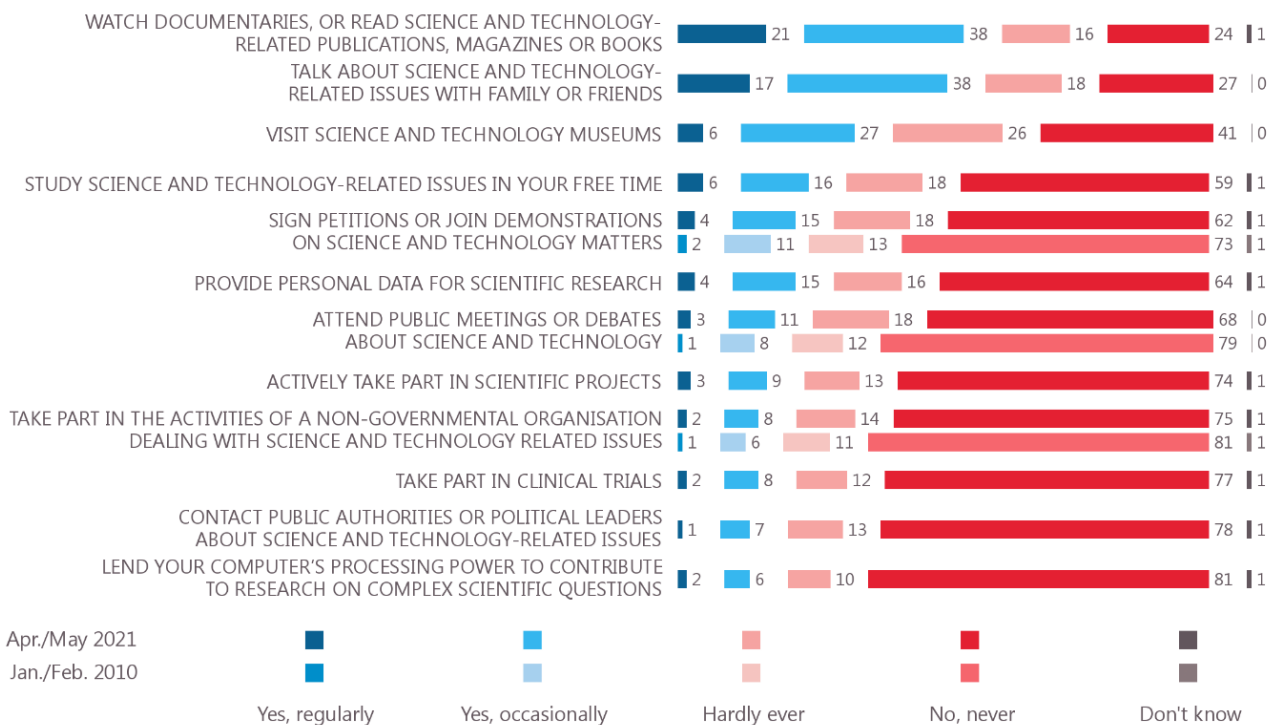
Europeans are most likely to **engage with science and technology** by watching documentaries or reading science and technology-related publications, magazines or books. One in five respondents (21%) say they do this regularly and 38% occasionally. The second most common form of engagement is talking about science and technology-related issues with family or friends, which is done regularly by 17% and occasionally by 38%. One in three (33%) say they visit science and technology museums at least occasionally, and this includes 6% who do this regularly.

There are three activities that are done by around one in five respondents at least occasionally: studying science and technology-related issues in their free time (22%, including 6% regularly), signing petitions or joining demonstrations on science and technology matters (19%, including 4% regularly) and providing personal data for scientific research (19%, including 4% regularly).

More than one in ten say they attend public meetings or debates about science and technology (14%), or actively take part in scientific projects (12%) at least occasionally; in both cases, 3% do these activities regularly.

The other activities are less common: taking part in the activities of a non-governmental organisation dealing with science and technology-related issues (10% at least occasionally), taking part in clinical trials (also 10%), contacting public authorities or political leaders about science and technology-related issues (8%), and lending a computer's processing power to contribute to research on complex scientific questions (also 8%). In each case, only 1% or 2% of respondents do these activities regularly.

QA14 And now, a few questions on how you engage with science and technology issues. Do you
 (% - EU27)



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In 22 EU Member States, at least half of respondents say they *regularly or occasionally watch documentaries or read science and technology-related publications, magazines or books*. The proportion is highest in Estonia (91%), Luxembourg (89%), Portugal (87%), Ireland (86%) and Finland (85%). However, respondents are much less likely to watch documentaries or read science and technology-related publications, magazines or books, regularly or occasionally, in Romania (32%), Slovakia (39%), Poland (40%), Italy (42%) and Bulgaria (43%).

There is considerable variation across EU Member States in the proportion of respondents who say they *talk about science and technology-related issues with family or friends*. At least eight in ten respondents do this regularly or occasionally in Portugal (85%), Estonia (84%), Luxembourg (82%) and Ireland (80%). This compares with less than four in ten respondents who do this occasionally or regularly in Bulgaria (33%), Poland (34%), Italy and Romania (both 36%) and Slovakia (38%). Looking at the non-EU countries, the proportion that say they talk about science and technology-related issues with family or friends (regularly or occasionally) is highest in Switzerland (80%) and lowest in Montenegro (34%).

There is wide variation across EU Member States in the proportion of respondents who *visit science and technology museums*. In seven Member States, more than half of respondents say they do this regularly or occasionally, with the highest proportions in Estonia (64%), Portugal (59%), Latvia (56%) and Ireland (55%). By contrast, less than a quarter visit science and technology museums regularly or occasionally in Bulgaria (21%), Slovakia and Greece (both 22%), and Hungary and Romania (both 23%).

In six EU Member States, more than a third of respondents say that they *study science and technology-related issues in their free time*, either regularly or occasionally: Estonia (45%), Portugal (39%), Cyprus (38%), Ireland and Luxembourg (both 37%), and Lithuania (34%). The lowest proportions that do this occasionally or regularly are in Bulgaria (7%), Slovakia and Hungary (both 14%), and Italy (15%).

Respondents in Portugal are most likely to say that they *sign petitions or join demonstrations on science and technology matters*: 10% say they do this regularly and 36% occasionally. The proportion that do this occasionally or regularly is also high in Lithuania and Luxembourg (both 40%), Ireland (35%) and the Netherlands (32%). By contrast, no more than one in ten respondents do this regularly or occasionally in Greece (4%), Bulgaria (6%) and Hungary (10%). Greece and Bulgaria are also the countries where respondents are most likely to say they *never sign petitions or join demonstrations on science and technology matters* (86% and 82% respectively). Looking at the 11 other countries surveyed, the proportion that say they sign petitions or join demonstrations on science and technology matters (regularly or occasionally) is highest in Turkey (44%) and lowest in the Republic of North Macedonia (13%).

Since January/February 2010³², there has been an increase in the proportion of EU citizens who say they sign petitions or join demonstrations on science and technology matters. In total, 4% now say they do this regularly (+2 pp), while 15% do this occasionally (+4 pp). Some Member States show large increases in the proportion of respondents who sign petitions or join demonstrations on science and technology matters (regularly or occasionally): Portugal (+35 pp), Lithuania (+30 pp), Ireland (+27 pp) and Luxembourg (+22 pp). The proportion has decreased in only two countries: Slovakia (-6 pp) and Greece (-4 pp). Analysis of non-EU countries surveyed also shows large increases in Turkey (+39 pp) and the United Kingdom (+20 pp).

There is wide variation across EU Member States in the proportions that say they *provide personal data for scientific research*. In 12 Member States, more than a third of respondents say that they do this regularly or occasionally, and this rises to over half in Estonia (58%), Finland (57%) and Ireland (51%). By contrast, no more than one in ten provide personal data for scientific research regularly or occasionally in Bulgaria (4%), Greece (5%), Spain (8%) and Poland (10%). Looking at the non-EU countries surveyed, the proportion that say they provide personal data for scientific research (regularly or occasionally) is highest in Iceland (65%) and lowest in Serbia (11%).

Respondents in Lithuania and Luxembourg (both 22%), and Austria (20%), are most likely to say they *attend public meetings or debates about science and technology*, either regularly or occasionally. Respondents are least likely to do this occasionally or regularly in Bulgaria (6%), Slovakia (7%) and Hungary (8%). Looking at the non-EU countries surveyed, the proportion that say they attend public meetings or debates about science and technology, either regularly or occasionally, is by far the highest in Turkey (41%) while it is lowest in Serbia (6%).

The proportion of EU citizens who say they attend public meetings or debates about science and technology has increased since January/February 2010³³, with 3% now doing this regularly (+2 pp) and 11% occasionally (+3 pp). The largest increases in the proportions that attend meetings or debates (regularly or occasionally) are seen in Lithuania (+15 pp), Czechia (+11 pp) and Ireland (+11 pp). The proportion has decreased in just three Member States: Greece (-4 pp), Slovakia (-2 pp) and Sweden (-1 pp). Analysis of the other countries surveyed also shows a large increase in Turkey (+30 pp).

In seven EU Member States, more than one in five respondents say they *actively take part in scientific projects*, either regularly or occasionally. The proportion is highest in Luxembourg (24%), and the Netherlands, Portugal and Lithuania (all 23%). By contrast, just 4% do this at least occasionally in Bulgaria, 5% in Greece, and 6% in Spain. Looking at the other countries surveyed, the proportion that say they actively take part in scientific projects, either regularly or occasionally, ranges from 47% in Turkey to 7% in Serbia.

³² In 2010 the United Kingdom was still part of the European Union but Croatia had not yet joined. The 2010 total therefore refers to an "EU 27" that includes the UK but not Croatia. This analysis is based on the 28 countries that were part of the EU at either of the two time points (January-February 2010 and April-May 2021).

³³ In 2010 the United Kingdom was still part of the European Union but Croatia had not yet joined. The 2010 total therefore refers to an "EU 27" that includes the UK but not Croatia. This analysis is based on the 28 countries that were part of the EU at either of the two time points (January-February 2010 and April-May 2021).

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Respondents are most likely to say they *take part in the activities of a non-governmental organisation dealing with science and technology related issues*, occasionally or regularly, in Romania, Lithuania and Austria (all 19%), and Luxembourg (17%). The proportion is lowest in Greece (3%), Bulgaria (4%), and France and Slovakia (both 5%). The proportion that *never* does this is highest in Greece (89%), Bulgaria (87%), Spain (86%) and France (85%). Looking at the non-EU countries surveyed, the proportion that say they take part in the activities of a non-governmental organisation dealing with science and technology-related issues (regularly or occasionally) is highest in Turkey (40%) and lowest in Serbia (6%).

The proportion of EU citizens who say they take part in the activities of a non-governmental organisation dealing with science and technology-related issues has increased slightly since January/February 2010, with 2% now doing this regularly (+1 pp) and 8% occasionally (+2 pp)³⁴. The largest increases in the proportions that take part in activities occasionally or regularly are seen in Romania (+15 pp), Lithuania (+13 pp), Latvia (+11 pp) and Austria (+10 pp). The proportion has decreased only in Greece (-3 pp), while it has remained the same in Belgium, Slovakia and Sweden. Analysis of the other non-EU countries surveyed also shows a large increase in Turkey (+34 pp).

Respondents in Estonia are by far the most likely to say they *take part in clinical trials*, with 43% doing this regularly or occasionally. Participation in clinical trials is also relatively high in Lithuania (26%), Denmark and Luxembourg (both 23%), and Finland (21%). By contrast, very few respondents do this regularly or occasionally in Greece (1%), and Bulgaria, Slovakia and France (all 4%). Looking at the 11 other countries surveyed, respondents in Iceland (51%) are most likely to say they take part in clinical trials (regularly or occasionally), while those in Serbia (5%) are least likely to say they do this.

Respondents in Romania (20%), Austria (17%), Ireland and Lithuania (both 16%) are most likely to say they regularly or occasionally *contact public authorities or political leaders about science and technology-related issues*. Looking at the non-EU countries surveyed, respondents in Turkey (33%) are most likely to say they regularly or occasionally contact public authorities or political leaders about science and technology-related issues, compared with Serbia (6%).

Respondents are most likely to say they *lend their computer's processing power to contribute to research on complex scientific questions*, either regularly or occasionally, in Romania (19%), Lithuania (17%), and Portugal, Austria and Luxembourg (all 16%). The lowest proportions are seen in Greece (2%), Bulgaria (4%), and Denmark, Slovenia and Spain (all 5%). Looking at the other non-EU countries surveyed, the proportion that say they lend their computer's processing power to contribute to research on complex scientific questions (regularly or occasionally) is by far the highest in Turkey (41%), while it is lowest in Serbia (5%).

Levels of engagement with science and technology vary across socio-demographic groups. On several items, levels of engagement are higher among men than women, the largest difference being in the proportion that watch documentaries or read science and technology-related publications, magazines or books (64% vs 55% that do this occasionally or regularly).

Older respondents aged 55 or over are less likely to engage than younger respondents. For example, 15% say that they study science and technology-related issues in their free time occasionally or regularly, compared with 31% of 15-24 year olds and 29% of 25-39 year olds.

There are large differences by level of education. Respondents who finished education at the age of 20 or above are more likely to engage with science and technology. For example, 47% say they visit science and technology museums occasionally or regularly compared with 10% of those who left education by the age of 15.

Respondents who never/almost never have difficulty paying bills are more likely to watch documentaries or read science and technology-related publications, magazines or books (62%), talk about science and technology-related issues with family or friends (59%) and visit science and technology museums (34%) than respondents who have difficulties paying bills most of the time (50%, 45% and 26% respectively). However, respondents who have difficulty paying their bills most of the time are more likely to actively take part in scientific projects (16%), take part in clinical trials (13%), contact public authorities or political leaders about science and technology-related issues (13%) and lend their computer's processing power to contribute to research on complex scientific questions (14%) than those who never/almost never have difficulties paying their bills (11%, 9%, 6% and 7% respectively).

Levels of engagement are also linked to knowledge about science. Respondents who answered more than eight questions correctly in the 'quiz' are more likely to engage with the various activities. For example, 78% regularly or occasionally talk about science and technology-related issues with family or friends, compared with 31% of those who answered less than 5 answers correctly.

Respondents who have worked in research, science or innovative technology development are also more likely to engage in various ways, particularly when both the respondent and a family member have worked in one of these areas. For example, the proportion that watch documentaries or read science and technology-related publications, magazines or books, occasionally or regularly, is 91% where both the respondent and a family member work in a science-related area, compared with 54% of respondents with no personal or family connection with this type of work.

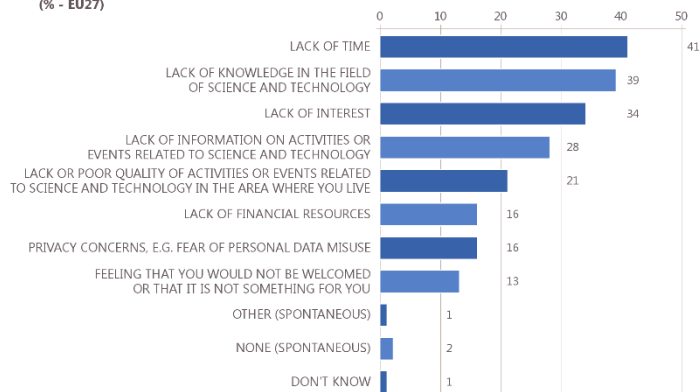
Unsurprisingly, some of the largest differences relate to levels of interest in scientific discoveries. For example, 22% of those who are interested in scientific discoveries attend public meetings about science and technology matters compared to just 4% who are not interested.

³⁴ This analysis is based on the 28 countries that were part of the EU at either of the two time points (January-February 2010 and April-May 2021).

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The main **barriers to engagement with science and technology** are lack of time (mentioned by 41% of respondents), lack of knowledge (39%) and lack of interest (34%). In relation to science and technology activities or events, almost a third (28%) cite lack of information about these activities or events and more than one in five (21%) cite lack or poor quality of activities or events in their area.

QA16 Sometimes people find it difficult to engage with science and technology. Which of the following, if any, are the main barriers for you? (MULTIPLE ANSWERS POSSIBLE)
(% - EU27)



One in six respondents (16%) say that lack of financial resources is a barrier, while the same proportion (16%) cite privacy concerns. Finally, 13% of Europeans feel that they would not be welcomed or that it is 'not something for them'.

Among the 27 EU Member States, *lack of time* is most frequently mentioned by respondents as a barrier to engagement with science and technology in Cyprus (59%), Sweden (56%) and Luxembourg (55%).

Lack of knowledge is cited most frequently by respondents in Portugal (56%), and Belgium, Czechia and Luxembourg (all 52%), while *lack of interest* is most likely to be mentioned by those in Austria and Croatia (both 44%), and Bulgaria (40%).

Respondents in Portugal (60%) and Ireland (47%) are most likely to cite a *lack of information on activities and events* as a barrier, while these two countries also rank highest for *lack or poor quality of activities or events in their area*: Ireland (49%) and Portugal (35%).

A *lack of financial resources* is mentioned most frequently by respondents in Romania (33%), Portugal (32%), Estonia (29%) and Lithuania (28%), while respondents in Portugal (27%), and Ireland and Malta (both 23%) are most likely to mention *privacy concerns*. Respondents in Latvia (29%), Luxembourg (23%) and Belgium (20%) are most likely to *feel that they would not be welcomed or that it is 'not something for them'*.

Looking at the non-EU countries surveyed, the main differences are that respondents in Turkey (48%) and Kosovo (41%) are most likely to mention lack of financial resources as a barrier to engagement with science and technology, while those in Turkey (44%) are particularly likely to mention the lack or poor quality of activities or events in their area. Respondents in Albania (44%) and the UK (40%) are most likely to cite a lack of information on activities and events as a barrier.

In the socio-demographic analysis, the barriers to engagement with science and technology can differ according to groups:

While barriers to engagement are mostly similar for men and women, women are more likely to mention lack of knowledge in the field (41% vs 36%) and lack of interest (36% vs 31%), while men are more likely to mention lack of time (43% vs 39%) and lack or poor quality of activities or events in their area (22% vs 19%).

There are differences by age. Respondents aged 25-39 and 40-54 are the most likely to say that lack of time is a barrier (52% and 50% respectively), while lack of financial resources is mentioned most frequently by 15-24 year olds (20%). Those aged 55 or over are the most likely to mention lack of knowledge in the field of science and technology (42%). Lack of interest is mentioned more by 15-24 year olds (36%) and by those aged 55 or over (37%) than by those aged 25-39 (30%) or those aged 40-54 (31%).

The main difference by level of education is that more highly educated respondents (who finished education at the age of 20 or above) are more likely to say lack of time is a barrier (49% vs 24% of those who left education by the age of 15) and less likely to cite lack of interest (26% vs 47%).

Among respondents who are interested in scientific discoveries, the main barrier is lack of time (47%). These respondents are also more likely than those who are not interested in scientific discoveries to mention lack or poor quality of activities or events in their area (25% vs 14%) and lack of information about these activities or events (32% vs 18%).

VI. YOUNG PEOPLE, GENDER EQUALITY, AND SOCIAL RESPONSIBILITY IN SCIENCE AND TECHNOLOGY



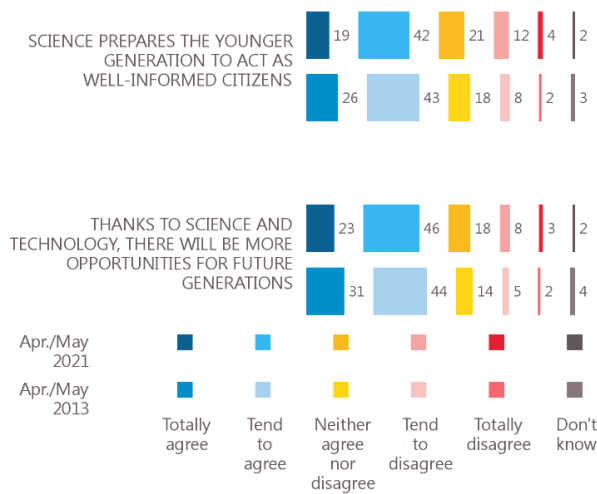
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1. Young people and science

Respondents were asked to say how much they agreed or disagreed with the following statements:

- *“Science prepares the younger generation to act as well-informed citizens”;*
- *“Thanks to science and technology, there will be more opportunities for future generations”.*

QA10 The following are some statements that people have made about science and technology. For each statement, please indicate to what extent you agree or disagree.
 (% - EU27)



Around seven in ten respondents (69%) agree that *“Thanks to science and technology, there will be more opportunities for future generations”*, with just under one in four (23%) saying that they “totally agree”. One in nine respondents (11%) disagree, with only a small proportion (3%) saying that they “totally disagree”. Just under one in five respondents (18%) neither agree nor disagree with the statement.

These two measures were included in a Eurobarometer Survey conducted in 2013. Since 2013, the proportion of respondents who agree that science prepares the younger generation to act as well-informed citizens has fallen somewhat (-8 pp), driven by a decrease in the proportion who say they “totally agree” (-7 pp) and a small decrease in those who say they “tend to agree” (-1 pp). Similarly, there has been a drop in the proportion of respondents who agree that thanks to science and technology, there will be more opportunities for future generations (-6 pp), again driven by a decrease in the proportion who say they “totally agree” (-8 pp), though there is a small increase in the proportion who say they “tend to agree” (+2 pp).

The majority of respondents in 22 EU Member States agree with the statement *“Science prepares the younger generation to act as well-informed citizens”*:

At least three-quarters of respondents agree in Bulgaria, Greece and Malta (78% in each), Cyprus (77%), Hungary (76%) and Italy and Spain (both 75%), compared with the EU average of 61%.

Cyprus has a particularly high proportion of respondents (45%) who say they ‘totally agree’ with this statement, and at least three in ten respondents say they ‘totally agree’ in Bulgaria, Malta and Spain (35% in each), and Greece and Hungary (both 31%), compared with the EU average of 19%. The lowest levels of agreement on this measure are seen in the Netherlands (42%), Germany (45%), Belgium (46%), and France and Luxembourg (49% in each).

Among the non-EU countries surveyed, a notably high proportion of respondents in Turkey (82%) and Kosovo (76%) agree that science prepares the younger generation to act as well-informed citizens. Albania is the only country where only a minority of respondents (32%) agree with this statement.

Comparing the current results with those in 2013, in most EU Member States (23) the proportion of respondents who agree that science prepares the younger generation to act as well-informed citizens has decreased, with the biggest shifts in Denmark (-18 pp), Finland (-21 pp), and Luxembourg (-16 pp), with a further ten EU Member States³⁵ showing declines of between 10 and 14 percentage points. Italy, Cyprus and Hungary are the only EU Member States where the proportion of respondents who agree has increased, and the increases are small (no more than +3 pp). In Slovakia there has been no change in the proportion who agree with this statement. The only non-EU country where this measure was included in the 2013 survey is the UK, and it shows a small increase in the proportion of respondents who agree that science prepares the younger generation to act as well-informed citizens (+3 pp).

Focusing on the current survey, the majority of respondents in all EU Member States agree that *“Thanks to science and technology, there will be more opportunities for future generations”*:

Agreement is highest in Estonia (83%), followed by the Netherlands, Bulgaria and Malta (79% in each). Around a third of respondents in Spain (32%), Estonia (33%), and Bulgaria, Malta, Hungary and Cyprus (35% in each) say they ‘totally agree’ with this statement, compared with the EU average of 23%. The lowest levels of agreement are in Romania (56%) and France (55%).

Among the non-EU countries surveyed, respondents in Turkey (81%), Norway (76%) and Kosovo (75%) are most likely to agree that thanks to science and technology, there will be more opportunities for future generations Kosovo. As seen in relation to the two measures already reported on in this section, a relatively low proportion of respondents in Albania (32%) agree with the statement.

³⁵ Belgium, Bulgaria, Czechia, Ireland, Croatia, Latvia, the Netherlands, Austria, Romania and Slovenia.

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Comparing the current results to those of 2013, there are 23 EU Member States where the proportion of respondents who agree that science and technology will provide more opportunities for future generations has dropped, with the largest declines in Luxembourg (-20 pp), Sweden (-16 pp), France (-15 pp), Austria (-13 pp), Denmark (-12 pp), Romania (-11 pp), and Belgium and Ireland (both -10 pp). Among the four countries showing an increase in the proportions agreeing with this statement, the shifts are small, with the most notable in Italy (+5 pp). Again, the UK is the only non-EU country where this measure was included in the 2013 survey, and it shows a notable decline in the proportion of respondents who agree that science and technology will provide more opportunities for future generations (-13 pp).

For the statement that 'science prepares the younger generation to act as well-informed citizens', there is very little difference by gender (61% of men agree vs. 60% of women) and differences related to age range from 59% for respondents aged 40-54 to 61% for those aged 15-24 and 55+. When it comes to educational level, respondents who are still studying (64%) are more likely to agree with the statement than those who have completed full-time education aged 20 or over (58%).

Looking at whether 'thanks to science and technology there will be more opportunities for future generations', men are slightly more likely to agree (71%) than women (67%). Respondents aged 15-24 are also more likely to agree with this statement (75%) than those aged 25-39 (70%). Those who are still studying are also more likely to agree with the statement (76%) than people who have completed full-time education aged 15 or under (63%). Respondents who rarely have difficulties paying their household bills are more likely to agree (70%) than those who have difficulties 'from time to time' (67%) or those who have difficulties 'most of the time' (57%). Respondents who use the internet everyday are also more likely to agree with this statement (71%) than those who use it sometimes/often (63%) or never (61%).

Respondents who think that the overall influence of science and technology on society is positive and those who are more interested in new scientific discoveries and developments, new medical discoveries and environmental problems are more likely to agree with the statements.

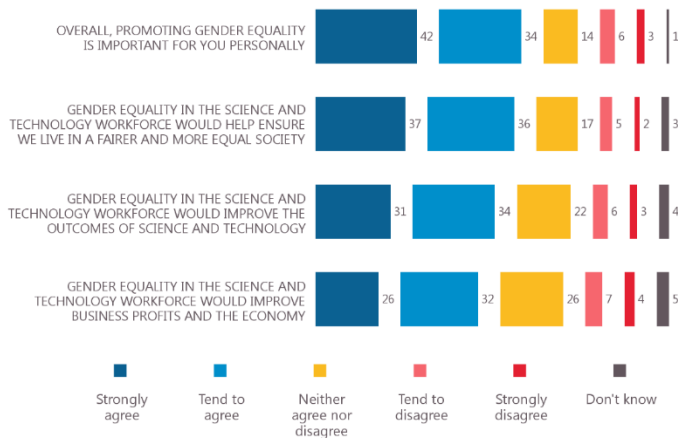
2. Gender equality and science and technology

This section examines opinions on gender equality in general and in particular in relation to science and technology. Respondents were presented with a list of statements and asked how much they agreed or disagreed with each³⁶:

- *“Overall, promoting gender equality is important for you personally”;*
- *“Gender equality in the science and technology workforce would help ensure we live in a fairer and more equal society”;*
- *“Gender equality in the science and technology workplace would improve the outcomes of science and technology”;*
- *“Gender equality in the science and technology workforce would improve business profits and the economy”;*
- *“Science and technology pay sufficient attention to differences between women’s and men’s needs”.*

At the EU level, three-quarters of respondents (76%) agree that *“Overall, promoting gender equality is important for you personally”*, with just over two-fifths (42%) saying that they “strongly agree”. Fewer than one in ten respondents (9%) disagree with the statement, with only 3% saying they “strongly disagree”. One in seven respondents (14%) neither agree nor disagree with the statement.

QA18 How strongly do you agree or disagree with each of the following statements? (% - EU27)



Just under three-quarters of respondents (73%) agree that *“Gender equality in the science and technology workforce would help ensure we live in a fairer and more equal society”*, with proportions evenly divided between those who say they “strongly agree” (37%) and those who “tend to agree” (36%). Only a small proportion of respondents disagree (7%), with a small minority saying they “strongly disagree” (2%). One in six respondents (17%) are neutral.

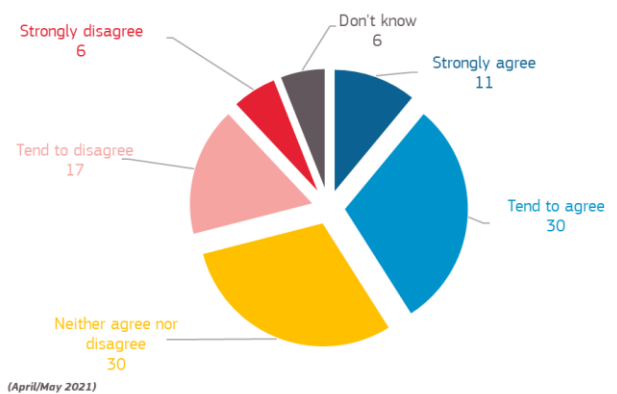
Around two-thirds of respondents (65%) agree that *“Gender equality in the science and technology workplace would improve the outcomes of science and technology”*, with opinion broadly divided between those who “strongly agree” (31%) and those who “tend to agree” (34%). Fewer than one in ten respondents (9%) disagree, with just a small minority saying they ‘strongly disagree’ (3%).

A somewhat smaller majority of respondents (58%) agree that *“Gender equality in the science and technology workforce would improve business profits and the economy”*, with around one in four respondents saying they ‘strongly agree’ (26%). One in nine respondents (11%) disagree, with only a small proportion (4%) saying that they ‘strongly disagree’.

Across these five measures, respondents are least likely to agree that *“Science and technology pay sufficient attention to differences between women’s and men’s needs”*.

Around two in five respondents (41%) agree that science and technology pay sufficient attention to differences between women’s and men’s needs, of whom one in nine (11%) “strongly agree”. Just under a quarter of respondents (23%) disagree, with only a small minority (6%) saying they “strongly disagree”. A higher proportion of respondents (30%) say they neither agree nor disagree with this statement than for the other four statements.

QA17.5 How strongly do you agree or disagree with the following statements? **Science and technology pay sufficient attention to differences between women’s and men’s needs (% - EU)**



In most EU Member States (24), the majority of respondents agree that *“Promoting gender equality is important for you personally”*. Respondents are most likely to agree that promoting gender equality is important for them personally in Spain and Cyprus (both 89%). There are only three EU Member States where a minority of respondents agree that promoting gender equality is important for them personally: Lithuania (44%), Estonia (46%) and Latvia (47%). Among the non-EU countries surveyed, respondents in Iceland (87%) are most likely to agree that promoting gender equality is important to them, while respondents in Serbia (40%) are the least likely to agree with this statement.

³⁶ Four of the statements are taken from QA18 and one from QA17.

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In all but one Member State, the majority of respondents agree that *“Gender equality in the science and technology workforce would help ensure we live in a fairer and more equal society”*. Respondents are most likely to agree that gender equality in the science and technology workforce would help ensure a fairer and more equal society in Greece and Cyprus (both 88%), Portugal (86%), Malta (85%) and Spain (83%). This compares with the EU average of 73%. Among the non-EU countries surveyed, respondents are most likely to agree that gender equality in the science and technology workforce would help ensure a fairer and more equal society in Turkey (82%) and Kosovo (81%), with the majority in both saying they “strongly agree” – Kosovo (55%) and Turkey (53%). Serbia is the only country where a minority of respondents (48%) agree with the statement, with around three in ten (29%) saying they neither agree nor disagree.

In most EU Member States (22), the majority of respondents agree that *“Gender equality in the science and technology workplace would improve the outcomes of science and technology”*. Respondents are most likely to agree that gender equality in the science and technology workplace would improve the outcomes of science and technology in Cyprus (83%), Malta (77%), and Greece and Italy (both 76%). This compares with an average of 65% at the EU level. Among the non-EU countries surveyed, respondents in Kosovo (82%) and Turkey (79%) are most likely to agree that gender equality in the science and technology workplace would improve the outcomes of science and technology. The majority of respondents ‘strongly agree’ in Kosovo (56%). The only country where a minority of respondents agree with this statement is Serbia (43%). A relatively large proportion of respondents in Montenegro (33%) and the UK (31%) say they neither agree nor disagree with this statement.

There are 17 EU Member States where the majority of respondents agree that *“Gender equality in the science and technology workforce would improve business profits and the economy”*. Respondents are most likely to agree that gender equality in the science and technology workforce would improve business profits and the economy in Cyprus (78%), Italy (73%) and Greece (71%). The EU Member States where respondents are least likely to agree that gender equality in the science and technology workforce would improve business profits and the economy are Estonia (30%), Latvia (34%), the Netherlands (37%), Czechia (38%), and Belgium and Finland (39% in each). All of these countries have notably high proportions of respondents who say they neither agree nor disagree with the statement. Among the non-EU countries surveyed, respondents are most likely to agree that gender equality in the science and technology workforce would improve business profits and the economy in Kosovo (79%) and Turkey (78%). In both these countries a notably high proportion of respondents say they “strongly agree” – 51% in Kosovo and 46% in Turkey.

There are only three EU Member States where a majority of respondents agree that *“Science and technology pay sufficient attention to differences between women’s and men’s needs”*: Poland (67%), Spain (53%) and Italy (51%). This compares with an EU average of 41%. Around one in five respondents say they “strongly agree” in Poland (21%) and Spain (20%), with a similar proportion holding this view in Cyprus (20%) – compared with the EU average of 11%. Respondents are least likely to agree that science and technology pay sufficient attention to differences between women’s and men’s needs in Sweden (19%) and Denmark (23%). Among the non-EU countries surveyed, respondents in Kosovo (59%), Montenegro (54%) and Turkey (52%) are most likely to agree that science and technology pay sufficient attention to differences between the needs of women and men. One in four respondents (25%) “strongly agree” in Kosovo, with one in five (20%) holding this view in Turkey.

There are consistent patterns that emerge in terms of the people in different socio-demographic and key variable groups who are more likely to agree with four of the five statements.

Starting with the statement on *“science and technology pays sufficient attention to differences between women’s and men’s needs”*, there are some marked differences on some key variables:

- men (46%) are more likely than women (38%) to agree with the statement;
- people who think that the overall influence of science and technology on society is positive (44%) are more likely to agree than those who think it is negative (34%);
- people who agree that promoting gender equality is important to them are more likely to agree (44%) than those who disagree (36%).

Focusing now on the four other statements, more consistent patterns emerge, with the following socio-demographic groups more likely to agree with the statements:

- Women, compared with men, with similar differences (6-8% points);
- Younger people, with the most marked differences in relation to the ‘promotion of gender equality being important to them’ - 81% of those aged 15-24 agree compared to 73% of those 55 and over.
- People who have stayed in education longer (age 16 and over), with the most marked difference seen in relation to ‘promoting gender equality being important to them’, with more who completed full-time education aged 20 or over agreeing (79%) than those who left education aged 15 or under (68%).
- People who use the internet, with the most notable differences in relation to agreement that ‘promoting gender equality is personally important’ (78% who use it every day vs 62% who never use it).

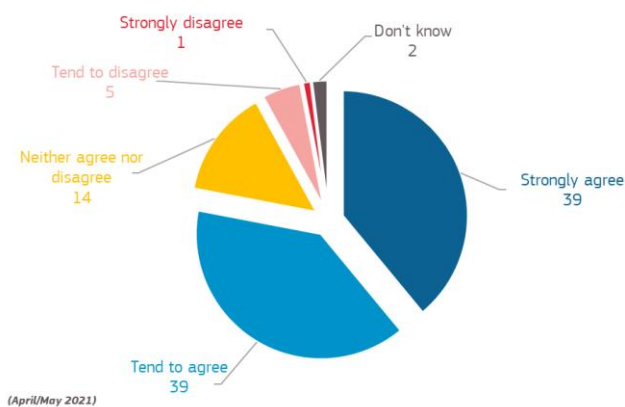
Looking at differences across key variable groups, the proportion of respondents who agree with these four statements is higher among people who think that the overall influence of science and technology on society is positive; and those who are interested in new scientific discoveries and developments.

3. Social responsibility in science and technology

The final section of this chapter looks at people's attitudes towards social responsibility in science and technology.

The chart below shows the extent to which respondents in EU Member States agree or disagree with the statement "Science and technology should consider the needs of all groups of people when developing new solutions and products".

QA17.6 How strongly do you agree or disagree with the following statements?
Science and technology should consider the needs of all groups of people when developing new solutions and products (% - EU)



At the EU level, just under eight in ten respondents (78%) agree that science and technology should consider the needs of all groups of people when developing new solutions and products, divided evenly between the proportions who "strongly agree" (39%) and "tend to agree" (39%). A small minority of respondents disagree with this statement (6%), with only a very small proportion (1%) saying they "strongly disagree". One in seven respondents (14%) neither agree nor disagree with the statement.

The majority of respondents in all EU Member States agree that science and technology should consider the needs of all groups of people when developing new solutions and products. Respondents are most likely to agree with the statement in Cyprus (90%), Greece and Portugal (both 88%), and Spain (86%). This compares with the EU average of 78%. The majority of respondents say they "strongly agree" in Cyprus (66% - notably higher than anywhere else), Spain (56%) and Greece (51%), compared with the EU average of 39%. Respondents are least likely to agree with this view in Romania (62%), France (66%) and Denmark (67%).

Among the non-EU countries surveyed, Turkey (86%) has the highest proportion of respondents who say they agree that science and technology should consider the needs of all groups of people when developing new solutions and products, with more than half of respondents (56%) saying they "strongly agree"; it is followed by Switzerland (85%). Albania (30%) is the only country where a minority of respondents agree with the statement - a significantly lower proportion than in any other country. Just over half of respondents in Albania (52%) say they neither agree nor disagree with the statement.

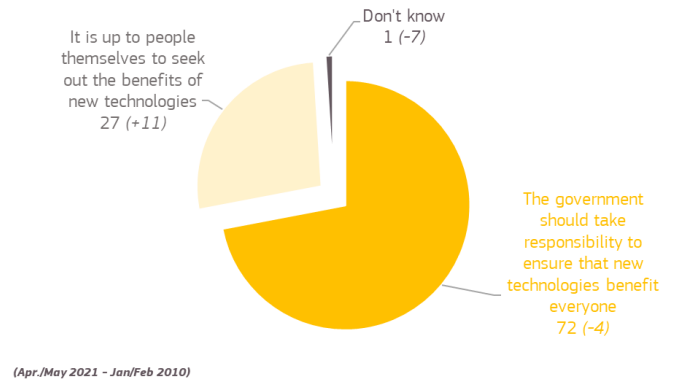
Patterns across different socio-demographic groups are quite consistent. There are only slight differences across most groups.

The most marked differences can be seen in relation to internet usage. Among those who use the internet every day, 79% agree that science and technology should consider the needs of all groups of people when developing new solutions and products, compared with 74% of those who use the internet sometimes or often and 67% of non-users.

In terms of the key variable groups, people who are particularly likely to agree with this statement are those who are interested in new medical discoveries, new scientific discoveries and technological developments, and environmental problems; those who think that the overall influence of science and technology on society is positive; and people who perform well in the 'quiz'.

Respondents were read out a series of paired statements and asked to choose which one of the two statements was closest to their point of view. The chart below shows the proportions of respondents at an EU level who either chose the statement "The government should take responsibility to ensure that new technologies benefit everyone" or "It is up to people themselves to seek out the benefits of new technologies" as being closest to their point of view.

QA13D Below are a series of questions with two statements each. For each pair, please select the statement which comes closest to your point of view. Please select one (% - EU)



Within the EU, just over seven in ten respondents (72%) think that the government should take responsibility to ensure that new technologies benefit everyone, compared with just over one in four (27%) who choose the alternative option.

This measure was included in an earlier Eurobarometer Survey (Special Eurobarometer 340 EB 73.1) conducted in 2010. Since then, there has been a notable increase in the proportion of respondents who think it is up to people themselves to seek out the benefits of new technologies (+11 percentage points), a smaller drop in the proportion who think that the government should take responsibility to ensure that new technologies benefit everyone (-4 pp), and a somewhat larger drop in the proportion who say they 'don't know' which of the two statements comes closest to their point of view (-7 pp).

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The majority of respondents in all EU Member States take the view that *“The government should take responsibility to ensure new technologies benefit everyone”*. Respondents are most likely to think that the government should take responsibility to ensure new technologies benefit everyone in Malta (84%), Belgium (83%) and Portugal (82%), with the lowest proportions in Cyprus (55%), and Poland and Romania (both 57%). Respondents are most likely to take the alternative view – that it is up to people themselves to seek out the benefits of new technologies – in Cyprus (44%), Poland (42%), Romania (40%), Sweden (38%) and Czechia (37%). Among the non-EU countries surveyed, respondents in Norway (83%), followed by those in the UK (77%), are most likely to take the view that the government should take responsibility to ensure new technologies benefit everyone.

Comparing the current results with those from 2010, there are 19 EU Member States where the proportion of respondents who think that the government should take responsibility to ensure that new technologies benefit everyone has dropped, with the most marked changes in Cyprus (-23 percentage points), Czechia (-19 pp), the Netherlands (-18 pp), Slovakia (-14 pp) and Slovenia (-13 pp). Among the seven EU Member States where the proportion of respondents who take this view has increased, increases tend to be small with the largest in Portugal (+6 percentage points). Among the seven EU Member States where the proportion of respondents who take this view has increased, increases tend to be small with the largest in Portugal (+6 percentage points). Among the non-EU countries surveyed, the most notable change is in Iceland (+6 pp), where there has been an increase in the proportion of respondents who take the view that the government should take responsibility to ensure new technologies benefit everyone.

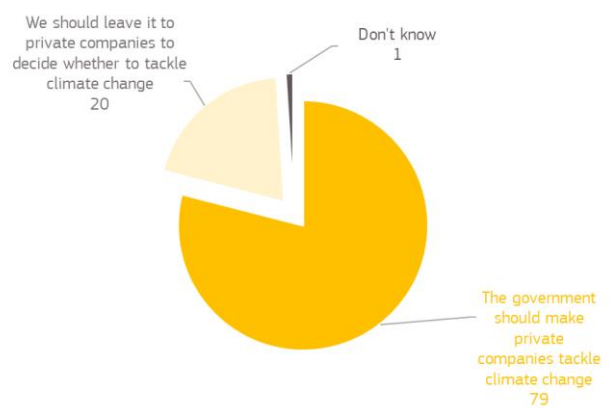
Differences across socio-demographic groups tend to be small. The most notable differences are in relation to age and occupational status, although even here the differences are relatively small: people aged 40-54 (73%) and 55 and over (75%), are somewhat more likely than average to agree that the government should take responsibility to ensure that new technologies benefit everyone than those aged 15-24 (66%) and 25-39 (69%). People who are unemployed (76%) and those who are retired (75%) are somewhat more likely than average to agree that the government should take responsibility, when compared with students (69%).

The chart below shows the proportions of respondents at the EU level who either chose the statement: *“The government should make private companies tackle climate change”* or *“We should leave it to private companies to decide whether to tackle climate change”* as being closest to their point of view.

Around eight in ten respondents (79%) think that the government should make private companies tackle climate change, compared with one in five respondents (20%) who take the view that it should be left to private companies to decide whether to tackle climate change.

Respondents are most likely to think that the government should make private companies tackle climate change in Portugal (92%), Malta and Ireland (both 91%), Greece (88%), and Belgium (87%). They are least likely to think this in Slovenia (59%), Romania (60%) and Latvia (64%). The majority of respondents in all the non-EU countries surveyed also take the view that the government should make private companies tackle climate change, with the highest proportions in the UK (87%) and Norway (85%) and the lowest in Kosovo (62%), North Macedonia (66%) and Bosnia and Herzegovina (68%).

QA13E Below are a series of questions with two statements each. For each pair, please select the statement which comes closest to your point of view. Please select one (% - EU)



(Apr/May 2021)

There are only minor differences between socio-demographic groups in relation to this question. The largest difference is between people who use the internet every day (80% agree) and those who never use it (70% agree). As seen earlier in relation to agreement that it should be the government's responsibility to ensure that new technologies benefit everyone, there is also more marked variation in relation to the key variable groups on this measure.

Most notably, the proportion of respondents who agree that the government should make private companies tackle climate change is higher among people who think that the overall influence of science and technology on society is positive; those who are more interested in environmental problems, new scientific discoveries and new medical discoveries; those who perform better in the 'quiz' and those who have, or did have in the past, a professional association with research, science and innovative technology development, through both their own work and that of a family member.

VII. COMPARATIVE ADVANTAGE OF THE EU IN SCIENCE



1. Cooperation with the rest of the world

Respondents were asked which of the following two statements came closest to their point of view:

- *“We should co-operate enthusiastically with the rest of the world and not isolate ourselves”;*
- *“Our lives are threatened by organised crime and terrorism, from which we urgently need to protect ourselves”.*

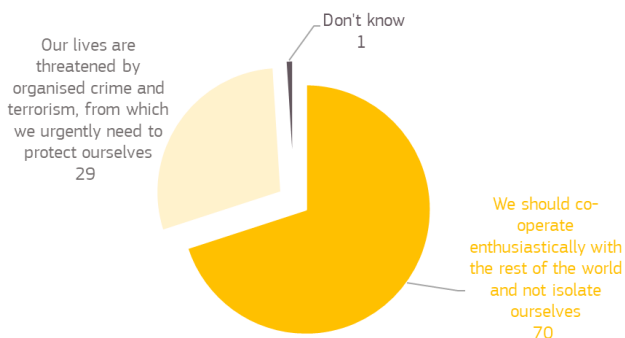
Seven in ten (70%) respondents say the statement that we should cooperate enthusiastically with the rest of the world and not isolate ourselves is closest to their opinion, while 29% say the view that our lives are threatened by organised crime and terrorism, from which we urgently need to protect ourselves is the best match to their own. Just 1% say they don't know.

The majority of respondents in each Member State say cooperating enthusiastically with the rest of the world and not isolating ourselves is closest to their point of view, although proportions range from 87% in Ireland, 84% in Portugal, and 81% in Estonia to 54% in Croatia, 55% in Romania and 56% in Slovakia, Cyprus and Greece.

The largest shares of respondents whose point of view is closest to the need for protection are in Croatia (46%), Slovakia (44%) and Cyprus (43%).

In the non-EU countries surveyed, the majority in every country also says cooperation without isolation is closest to their view, with proportions ranging from 84% in Norway to 55% in North Macedonia.

QA13F Below are a series of questions with two statements each. For each pair, please select the statement which comes closest to your point of view.
 Please select one (% - EU 27)



(Apr./May 2021)

The majority of respondents in each socio-demographic group say the statement “we should co-operate enthusiastically with the rest of the world and not isolate ourselves” is closest to their view, though there are differences in the strength of the skew towards that opinion:

For example, the younger the respondent, the more likely they are to say this view is the closest to their own, with 74% of 15-24 year olds saying this, compared to 65% of those aged 55 and older.

Those who remain in education longer, and those who experience fewer financial difficulties are also most likely to say this view best matches their own. For example, 77% of those who completed education aged 20 or older say this, compared to 58% of those who completed aged 15 or younger.

Students and managers (both 80%) are the most likely to hold this view, particularly compared to housepersons and retired persons (both 63%).

Although the majority of respondents across the political spectrum say cooperation best matches their view, the strongest support is from those who place themselves on the left of the political spectrum (79%), compared to 69% in the centre and 59% on the right.

Respondents who think the influence of science and technology is positive (72%) are more likely to think we should cooperate enthusiastically than those who think it is negative (53%). Respondents who did better in the quiz, or who have been involved in research, science, or innovative technology development, are also more likely to pick this statement.

2. Comparative advantage of the EU in making scientific discoveries

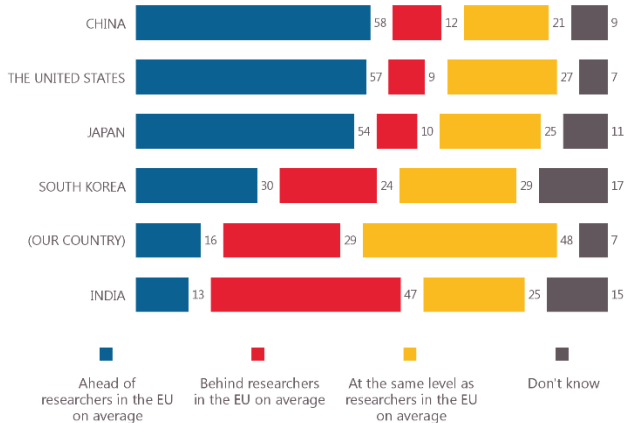
Respondents were asked whether they thought researchers in several countries were ahead, behind, or at the same level as researchers in the European Union on average, in terms of making new scientific discoveries.

The majority of respondents (58%) think researchers in *China* are ahead of those in the EU in making scientific discoveries. Just over one in five (21%) say researchers in the EU and China are at the same level, while 12% think they are behind those in the EU. Almost one in ten (9%) say they don't know.

Almost six in ten (57%) respondents think researchers in the *United States* are, on average, ahead of researchers in the EU. Just over one-quarter (27%) think they are at the same level, while 9% think scientists in the United States are behind the EU on average. More than one in twenty say they don't know (7%).

When asked about researchers in *Japan*, 54% of respondents think they are ahead of those in the EU on average in making new scientific discoveries, 25% say they are at the same level, and 10% think they are behind those in the EU. Just over one in ten (11%) say they don't know.

QA19 Do you think researchers in the following countries are ahead, behind, or at the same level as researchers in the European Union on average, in terms of making new scientific discoveries? (% - EU27)



Opinion about researchers in *South Korea* is more divided. Three in ten (30%) respondents think they are ahead of their counterparts in the EU, 29% that they are at the same level, and 24% think they are behind researchers in the EU. Almost one in five say they don't know (17%).

More than one in ten (16%) respondents think researchers in *their own country* are ahead of EU researchers on average when it comes to making new scientific discoveries. Almost half (48%) think they are at the same level, while 29% think researchers in their country are behind those in the EU.

Just over one in ten (13%) respondents think researchers in *India* are ahead of those in the EU in terms of making new scientific discoveries. One quarter (25%) think they are at the same level, while almost half (47%) think they are behind EU researchers. More than one in ten (15%) say they don't know.

In 23 countries, the majority of respondents think researchers in the *United States* are on average ahead of researchers in the EU in making new scientific discoveries. This view is most widely held in Spain (78%), Luxembourg (75%) and Cyprus (71%), and least widespread in Sweden (38%), Denmark (41%), and Finland and Estonia (both 43%). Respondents in Sweden (49%), Estonia (48%) and Denmark (45%) are most likely to say researchers in the United States are at the same level as those in the EU, while in Finland opinion is split between researchers in the United States being ahead of those in the EU (43%) and at the same level (43%). In 13 Member States at least one in ten respondents say researchers in the US are behind those in the EU, with the largest proportions seen in Poland and Austria (both 16%), and Romania (15%). The majority of respondents in all but two of the non-EU countries surveyed think researchers in the United States are ahead of those in the EU, with the proportion highest in Kosovo (73%). The exceptions are Norway and Iceland, where the majority think researchers in the United States and the EU are at the same level (50% and 44% respectively).

For each country asked about, the socio-demographic analysis focuses on those who think researchers in that country are ahead of those in the EU.

In the case of researchers in the United States, the socio-demographic analysis shows little difference in opinion based on age or financial situation (though respondents who have difficulty paying bills most of the time are less likely to think that researchers in the US are at the same level as those in the EU (22%) than respondents who never/almost never have difficulty paying bills (28%)). However, it does illustrate that men are more likely than women to think researchers in the United States are ahead of those in the EU (60% vs 55%). In addition, the longer a respondent remained in education, the more likely they are to think researchers in the United States are ahead, but the overall difference is relatively small (6 pp).

In all but one Member State a majority of respondents think researchers in *China* are ahead of those in the EU when it comes to making new scientific discoveries, although proportions vary from 76% in Cyprus, 75% in Spain, and 69% in Luxembourg to 41% in Sweden, and 42% in Poland and Estonia. The exception is Finland, where 40% say researchers in China are at the same level as those in the EU and 39% say those in China are ahead. Respondents in Estonia (44%), and Finland and Sweden (both 40%) are the most likely to say researchers in China and the EU are at the same level. This compares with Cyprus where fewer than one in ten (8%) have this view. In 20 countries at least one in ten respondents think researchers in China are behind those in the EU, with those in Lithuania (22%), and Austria and Finland (both 20%) the most likely to hold this opinion. A majority of respondents in each of the non-EU countries surveyed think researchers in China are ahead of those in the EU on average, with proportions ranging from 73% in Bosnia and Herzegovina to 41% in Iceland.

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The socio-demographic analysis shows few differences based on gender, education level or financial situation, but it does highlight that those aged 55 and older (55%) are less likely to say researchers in China are ahead of those in the EU, especially compared to those aged 15-24 (61%). It also shows unemployed respondents are the most likely to say researchers in China are ahead, particularly compared to retired persons (67% vs 54%).

In all but two Member States, respondents are most likely to say researchers in *Japan* are ahead of those in the EU. This view is most widespread in Latvia and Lithuania (both 75%), and Cyprus (74%), and least widespread in Austria (40%), Denmark (42%), and Finland and Germany (both 44%). In Finland, respondents are most likely to say researchers in Japan and the EU are at the same level (47%), while in Denmark opinion is evenly split between those who say researchers in Japan are ahead of or at the same level as their EU counterparts (both 42%). The highest proportions of respondents who think researchers in Japan are at the same level as those in the EU are in Finland (47%), Sweden (43%) and Denmark (42%). In nine Member States at least one in ten respondents think researchers in Japan are behind those in the EU, with the highest proportions in Poland and Austria (both 17%) and Romania (16%). Respondents in all but one of the non-EU countries surveyed are most likely to say researchers in Japan are ahead of those in the EU, with proportions ranging from 69% in Bosnia Herzegovina to 48% in Iceland. The exception is Switzerland, where respondents are most likely to say researchers in Japan and the EU are at the same level (48%).

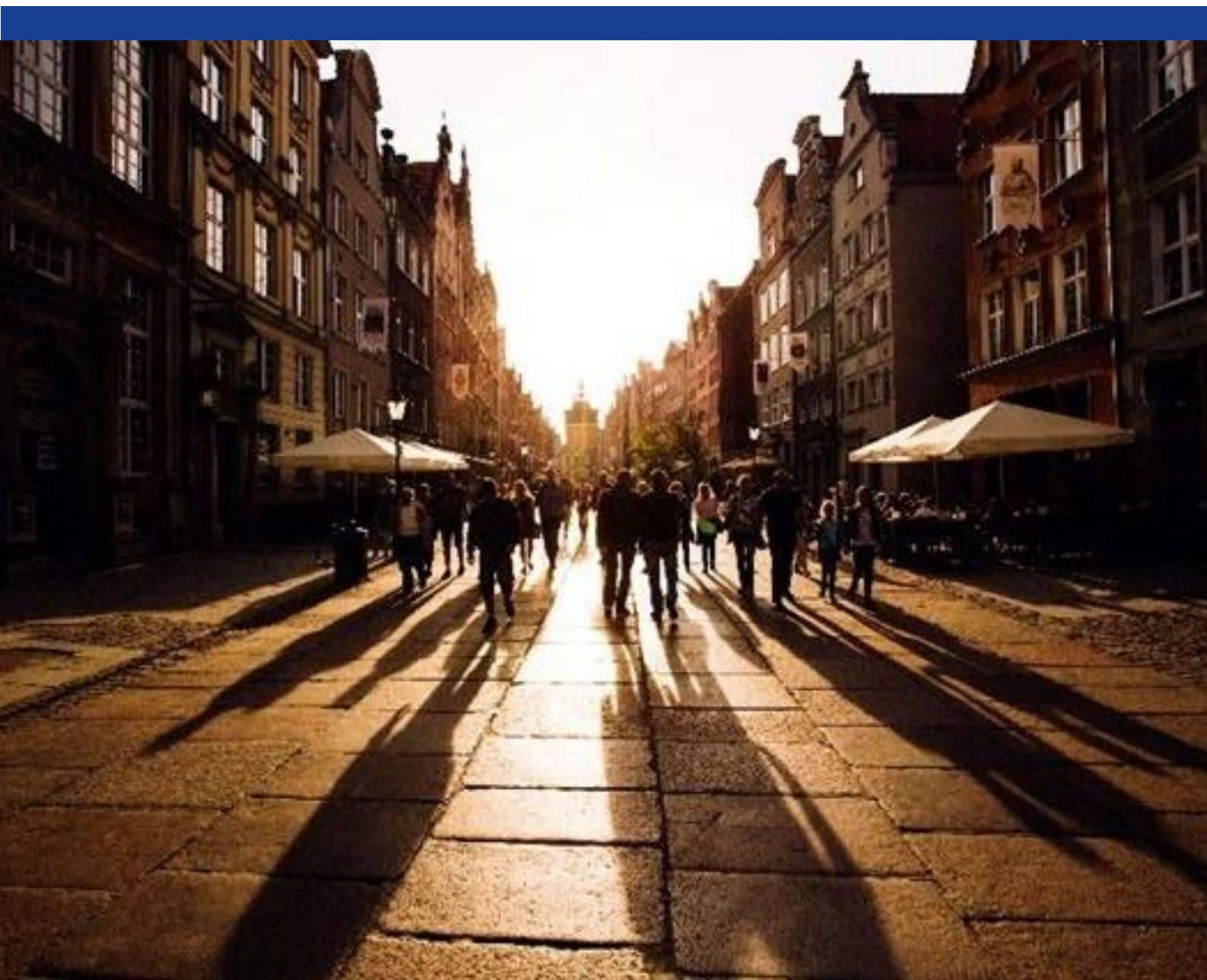
The socio-demographic analysis reveals no notable differences based on gender, age, education level or financial situation. However, it does show that unemployed persons are the most likely to say researchers in Japan are ahead of those in the EU, particularly when compared to retired persons (61% vs 51%).

Luxembourg (52%) is the only country where at least half of all respondents think researchers in *South Korea* are ahead of those in the EU. At least four in ten respondents in Czechia (41%), and Ireland, Cyprus, Latvia and Lithuania (all 40%) say the same. Overall, this is the most common response in 11 countries. In 12 countries, respondents most often say researchers in South Korea and the EU are at the same level, and this opinion is most widely held in Sweden (53%), and Finland and Estonia (both 50%). In every Member State more than one in ten think this way. There are four countries where respondents are most likely to say researchers in South Korea are behind those in the EU: Austria (35%), Romania (33%), Greece (30%) and Italy (29%). In every Member State more than one in ten respondents hold this opinion. There are five non-EU countries where respondents most often say researchers in South Korea are ahead of those in the EU, with the highest proportion observed in Albania (42%). In the remaining six countries the most common response is that they are at the same level, with the largest proportion seen in Norway (49%).

There are only two Member States where at least one in five respondents think researchers in *India* are ahead of those in the EU in terms of scientific discoveries: Luxembourg (23%) and Slovenia (20%). Overall, at least one in ten respondents in 21 countries hold this view. Sweden (43%) is the only country where respondents most often say researchers in India and the EU are at the same level. In all but one Member State, respondents are most likely to say researchers in India are behind those in the EU on average, although proportions range from 67% in Lithuania, 61% in Czechia, and 56% in Latvia to 37% in Bulgaria, 43% in Italy, and 44% in Poland and Germany. Looking at the non-EU countries surveyed shows that except for Norway, respondents most often say researchers in India are behind those in the EU, with the highest proportion seen in Turkey (65%). In Norway, respondents are most likely to say researchers in India and the EU are at the same level (43%).

Respondents in Germany (36%), the Netherlands (33%) and Denmark (25%) are most likely to say researchers in *their own country* are ahead of those in the EU on average. Only a minority of respondents in every country think this way. In 16 countries the most common opinion is that researchers in the respondent's country are at the same level as those in the EU, and this is particularly the case in Sweden (64%), Czechia (63%), and Finland, Belgium and Estonia (all 62%). Cyprus is the only country where fewer than one in five thinks this way. In 11 countries respondents are most likely to think researchers in their country are behind those in the EU, with the highest levels seen in Cyprus (69%), Latvia (67%) and Slovakia (57%). Overall, at least one in ten respondents in every Member State thinks this way. Outside of the EU countries surveyed, respondents in the UK (39%) and Switzerland (31%) are most likely to say that researchers in their own country are ahead of those in the EU. In Norway (61%) and Iceland (46%), the highest proportion of respondents state that researchers in their countries are at the same level as those in the EU. Finally, there are six countries where respondents most often say researchers in their country are behind those in the EU.

CONCLUSION



Special Eurobarometer 516

European citizens' knowledge and attitudes towards science and technology

This report provides a summary of the results of the Special Eurobarometer on “European citizens’ knowledge and attitudes towards science and technology”. This Eurobarometer is the latest in a long line of surveys on science and technology (S&T) stretching back to the late 1970s. It gathers the views of 37,103 people in April-May 2021 resident in 38 different countries – EU27, EU Enlargement countries, EFTA states, and the UK. This 2021 edition is the largest to date in terms of the number of people and countries surveyed and the breadth and depth of the questionnaire. It is also the first to be conducted in close to seven years, meaning that it helps fill a significant gap in our understanding of European citizens’ knowledge and attitudes towards S&T.

The results undoubtedly reflect the unprecedented crises that we are facing – notably the Covid-19 pandemic, but also climate change and biodiversity loss. At the same time, many of the results show remarkable congruence with previous survey findings, suggesting that while short-term contextual background does play a role in influencing attitudes, this does not disrupt significantly the longer-term trends and patterns.

The survey covered citizens’ knowledge about S&T, views on the impacts of S&T, views on the governance of S&T, attitudes towards scientists, citizens’ engagement in S&T, aspects related to young people, gender equality, and social responsibility, and the comparative advantage of the EU to elsewhere in the world.

As such, the survey reveals reassuring results, notably:

- EU citizens have a very high level of interest in S&T, in particular in new medical discoveries and in environmental problems;
- A large majority of EU citizens considers the influence of S&T on our way of life as positive, with strikingly high appreciation for some technologies such as solar, wind power and the development of vaccines;
- There is a very high level of support for the principle of open access to the results of publicly funded research;
- A large majority of EU citizens agrees that involving non-scientists in research and innovation (R&I) ensures that science and technology respond to the needs, values and expectations of society;
- More than two-thirds of EU citizens believe that scientists should intervene in political debates to ensure that decisions take into account scientific evidence;
- EU citizens have a positive view of scientists, believing that important qualities for scientists include intelligence, honesty, reliability, and morality.

The survey also exposes results that suggest work needs to continue to increase knowledge of science in the general public, combat disinformation, and further align research and innovation with the needs, values and expectations of society:

- Although there have been improvements in levels of scientific knowledge in some areas of science there are still low levels of knowledge across some socio-economic and demographic groups and countries;

- Many EU citizens are markedly critical of where the benefits of R&I flow – for instance thinking that S&T mostly help improve the lives of those who are already better off (57%) and going mostly to developed countries rather than developing ones (70%);
- A quarter of EU citizens do not believe that S&T pay sufficient attention to differences between women’s and men’s needs.

While the results can be taken at aggregate level, for instance for the EU27 as a whole, they are more striking when considering socio-demographic factors. Very few questions elicit cross-the-board consensus, though those questions that do may deserve particular attention from a policy perspective. For the majority of questions, however, results show clear patterns tracking social gradients related to age, sex, education, and actual and/or perceived marginalisation. An implication for research and innovation policy is that social differences and cleavages in opinion, knowledge and expectations probably matter. Finding ways to tackle them could build support for – and increase engagement with – science and technology and help respond to future challenges.

Technical Specifications

Between 13 April and 11 May 2021, Kantar - on behalf of Kantar Belgium - carried out the wave 95.2 of the Eurobarometer survey, at request of the European Commission, Directorate-General for Communication, "Media monitoring and Eurobarometer" Unit.

Wave 95.2 covers the population of the respective nationalities of the European Union Member States, resident in each of the 27 Member States and aged 15 years and over.

Wave 95.2 has also been conducted in 11 other countries or territories outside the EU: five candidate countries (Albania, Montenegro, North Macedonia, Serbia and Turkey), as well as in Bosnia and Herzegovina, Iceland, Kosovo, Norway, Switzerland and the United Kingdom.

In these countries and territories, the survey covers the national population of citizens and the population of citizens of all the European Union Member States that are residents in these countries and territories and have a sufficient command of the national languages to answer the questionnaire.

The basic sample design, applying in all countries and territories, was a multi-stage, random (probability) one. In each country, a number of sampling points was drawn with probability proportional to population size (for a total coverage of the country) and to population density.

In order to do so, the sampling points were drawn systematically from each of the "administrative regional units", after stratification by individual unit and type of area. They thus represent the whole territory of the countries surveyed according to the EUROSTAT NUTS II (or equivalent) and according to the distribution of the resident population of the respective nationalities in terms of metropolitan, urban and rural areas.

In each of the selected sampling points, a starting address was drawn, at random. Further addresses (every Nth address) were selected by standard "random route" procedures, from the initial address. In each household, the respondent was drawn at random (following the "closest birthday rule"). If no one answered the interviewer in a household, or if the selected respondent was not available (e.g. not present or busy), the interviewer revisited the same household up to three additional times (four contact attempts in total). Interviewers never indicated that the survey was conducted on behalf of the European Commission beforehand; they may have given this information once the survey was completed, upon request.

The recruitment phase was slightly different in the Netherlands. In this country, a sample of addresses within each areal sampling point (1km² grid) were selected from the address or population register. The selection of addresses was done randomly. Households were then contacted by telephone and recruited to take part in the survey.

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| COUNTRIES | INSTITUTES | N° INTERVIEWS | FIELDWORK DATES | | POPULATION 15+ | PROPORTION EU27 | |
|------------|----------------|---|-----------------|------------|----------------|-----------------|--------|
| BE | Belgium | Kantar Belgium | 1.014 | 19/04/2021 | 05/05/2021 | 9.188.369 | 2,45% |
| BG | Bulgaria | Kantar TNS BBSS | 1.049 | 13/04/2021 | 09/05/2021 | 5.995.194 | 1,60% |
| CZ | Czechia | Kantar Czechia | 1.038 | 19/04/2021 | 27/04/2021 | 8.956.740 | 2,39% |
| DK | Denmark | Kantar Gallup | 1.070 | 14/04/2021 | 10/05/2021 | 4.848.611 | 1,29% |
| DE | Germany | Kantar Deutschland | 1.525 | 13/04/2021 | 10/05/2021 | 71.728.398 | 19,10% |
| EE | Estonia | Kantar Emor | 1.022 | 15/04/2021 | 10/05/2021 | 1.073.224 | 0,29% |
| IE | Ireland | Kantar Belgium | 1.011 | 19/04/2021 | 10/05/2021 | 3.896.482 | 1,04% |
| EL | Greece | Kantar Greece | 1.056 | 13/04/2021 | 09/05/2021 | 9.187.524 | 2,45% |
| ES | Spain | TNS Investigación de Mercados y Opinión | 1.005 | 14/04/2021 | 09/05/2021 | 40.006.943 | 10,65% |
| FR | France | Kantar Public France | 1.015 | 13/04/2021 | 05/05/2021 | 52.732.499 | 14,04% |
| HR | Croatia | Hendal | 1.016 | 13/04/2021 | 10/05/2021 | 3.488.460 | 0,93% |
| IT | Italy | Kantar Italia | 1.017 | 13/04/2021 | 30/04/2021 | 52.397.331 | 13,95% |
| CY | Rep. of Cyprus | CYMAR Market Research | 506 | 13/04/2021 | 25/04/2021 | 734.695 | 0,20% |
| LV | Latvia | Kantar TNS Latvia | 1.009 | 14/04/2021 | 04/05/2021 | 1.568.124 | 0,42% |
| LT | Lithuania | TNS LT | 1.028 | 14/04/2021 | 06/05/2021 | 2.300.257 | 0,61% |
| LU | Luxembourg | Kantar Belgium | 520 | 19/04/2021 | 05/05/2021 | 503.275 | 0,13% |
| HU | Hungary | Kantar Hoffmann | 1.044 | 13/04/2021 | 28/04/2021 | 8.351.017 | 2,22% |
| MT | Malta | MISCO International | 525 | 16/04/2021 | 03/05/2021 | 426.055 | 0,11% |
| NL | Netherlands | Kantar Netherlands | 1.076 | 14/04/2021 | 07/05/2021 | 14.165.638 | 3,77% |
| AT | Austria | Das Österreichische Gallup Institut | 1.007 | 13/04/2021 | 02/05/2021 | 7.580.083 | 2,02% |
| PL | Poland | Kantar Polska | 1.008 | 13/04/2021 | 06/05/2021 | 32.139.021 | 8,56% |
| PT | Portugal | Marktest – Marketing, Organização e Formação | 1.031 | 19/04/2021 | 03/05/2021 | 8.869.051 | 2,36% |
| RO | Romania | Centrul Pentru Studierea Opiniei si Pietei (CSOP) | 1.051 | 13/04/2021 | 05/05/2021 | 16.372.216 | 4,36% |
| SI | Slovenia | Mediana D00 | 1.024 | 14/04/2021 | 09/05/2021 | 1.767.202 | 0,47% |
| SK | Slovakia | Kantar Czechia | 1.079 | 14/04/2021 | 04/05/2021 | 4.592.379 | 1,22% |
| FI | Finland | Kantar TNS Oy | 1.030 | 16/04/2021 | 10/05/2021 | 4.488.064 | 1,20% |
| SE | Sweden | Kantar Sifo | 1.051 | 14/04/2021 | 07/05/2021 | 8.149.850 | 2,17% |
| TOTAL EU27 | | | 26.827 | 13/04/2021 | 10/05/2021 | 375.506.702 | 100%* |

* It should be noted that the total percentage shown in this table may exceed 100% due to rounding

** Recruitments in Belgium, Czechia, Ireland, Luxembourg, Portugal and Slovakia are carried out by Kantar Belgium, Kantar Czechia, Ronin International, Infas, Kantar Portugal and Kantar Slovakia. Non-probabilistic sample in Turkey was randomly drawn from Kantar's LifePoints panel.

| | | | | | | | |
|-------|------------------------|-------------------|--------|------------|------------|-------------|--|
| UK | United Kingdom | Kantar UK Limited | 1.003 | 14/04/2021 | 11/05/2021 | 53.082.345 | |
| TR | Turkey | Kantar TNS Piar | 1.004 | 15/04/2021 | 10/05/2021 | 62.644.678 | |
| MK | North Macedonia | Kantar TNS BBSS | 1.036 | 15/04/2021 | 06/05/2021 | 1.736.495 | |
| ME | Montenegro | TMG Insights | 504 | 14/04/2021 | 09/05/2021 | 510.415 | |
| RS | Serbia | TMG Insights | 1.005 | 14/04/2021 | 08/05/2021 | 5.966.740 | |
| AL | Albania | Index Kosovo | 1.014 | 14/04/2021 | 05/05/2021 | 2.344.814 | |
| BA | Bosnia and Herzegovina | Kantar TNS BBSS | 1.009 | 14/04/2021 | 09/05/2021 | 2.987.440 | |
| IS | Iceland | Gallup Iceland | 520 | 14/04/2021 | 10/05/2021 | 289.125 | |
| XK | Territory of Kosovo | Index Kosovo | 1.057 | 15/04/2021 | 10/05/2021 | 1.357.100 | |
| NO | Norway | Kantar Norway | 1.041 | 14/04/2021 | 06/05/2021 | 4.392.175 | |
| CH | Switzerland | Demo SCOPE AG | 1.083 | 15/04/2021 | 10/05/2021 | 7.259.209 | |
| TOTAL | | | 37.103 | 13/04/2021 | 11/05/2021 | 518.077.238 | |

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| | COUNTRIES | N° OF CAPI INTERVIEWS | N° OF CAWI INTERVIEWS | TOTAL N° INTERVIEWS |
|----|------------------------|-----------------------|-----------------------|---------------------|
| BE | Belgium | | 1.014 | 1.014 |
| BG | Bulgaria | 1.049 | | 1.049 |
| CZ | Czechia | | 1.038 | 1.038 |
| DK | Denmark | 355 | 715 | 1.070 |
| DE | Germany | 1.525 | | 1.525 |
| EE | Estonia | | 1.022 | 1.022 |
| IE | Ireland | | 1.011 | 1.011 |
| EL | Greece | 1.056 | | 1.056 |
| ES | Spain | 1.005 | | 1.005 |
| FR | France | 1.015 | | 1.015 |
| HR | Croatia | 1.016 | | 1.016 |
| IT | Italy | 1.017 | | 1.017 |
| CY | Rep. of Cyprus | 506 | | 506 |
| LV | Latvia | | 1.009 | 1.009 |
| LT | Lithuania | | 1.028 | 1.028 |
| LU | Luxembourg | | 520 | 520 |
| HU | Hungary | 1.044 | | 1.044 |
| MT | Malta | 327 | 198 | 525 |
| NL | Netherlands | 784 | 292 | 1.076 |
| AT | Austria | 1.007 | | 1.007 |
| PL | Poland | 1.008 | | 1.008 |
| PT | Portugal | | 1.031 | 1.031 |
| RO | Romania | 1.051 | | 1.051 |
| SI | Slovenia | 694 | 330 | 1.024 |
| SK | Slovakia | 817 | 262 | 1.079 |
| FI | Finland | | 1.030 | 1.030 |
| SE | Sweden | | 1.051 | 1.051 |
| | TOTAL EU27 | 15.276 | 11.551 | 26.827 |
| UK | United Kingdom | | 1.003 | 1.003 |
| TR | Turkey | 288 | 716 | 1.004 |
| MK | North Macedonia | 1.036 | | 1.036 |
| ME | Montenegro | 504 | | 504 |
| RS | Serbia | 1.005 | | 1.005 |
| AL | Albania | 1.014 | | 1.014 |
| BA | Bosnia and Herzegovina | 1.009 | | 1.009 |
| IS | Iceland | | 520 | 520 |
| XK | Territory of Kosovo | 1.057 | | 1.057 |
| NO | Norway | | 1.041 | 1.041 |
| CH | Switzerland | | 1.083 | 1.083 |
| | TOTAL | 21.189 | 15.914 | 37.103 |

CAPI : Computer-Assisted Personal interviewing

CAWI : Computer-Assisted Web interviewing

Consequences of the coronavirus pandemic on fieldwork

■ Face-to-face interviewing

Where feasible, interviews were conducted face-to-face in people's homes or on their doorstep and in the appropriate national language. Countries where only face-to-face interviewing took place are: Bulgaria, Germany, Greece, Spain, France, Croatia, Italy, Cyprus, Hungary, Austria, Poland, Romania, Turkey, North Macedonia, Montenegro, Serbia, Albania, Bosnia and Herzegovina, and the territory of Kosovo. In all countries and territories where face-to-face interviewing was feasible CAPI (Computer Assisted Personal Interviewing) was used. For all interviews conducted face-to-face, hygiene and physical distancing measures were respected at all times in line with government regulations, and whenever possible, interviews were conducted outside homes (e.g. on doorsteps) to remain in open air and maintain social distance.

■ Face-to-face and online interviewing

In Denmark, Malta, the Netherlands, Slovenia, Slovakia and Turkey: face-to-face interviewing was feasible but it was not possible to reach the target number of face-to-face interviews within the fieldwork period due to the impact of Covid-19 restrictions: many potential respondents were reluctant to open their homes to interviewers, even if they respected hygiene rules and physical distancing, such as wearing masks and using hydro-alcoholic gel.

Therefore, to hit the target number of interviews within the fieldwork period, additional interviews were conducted online with Computer-Assisted Web Interviewing (CAWI) technique.

■ Online interviewing

In Belgium, Czechia, Estonia, Ireland, Latvia, Lithuania, Luxembourg, Portugal, Finland, Sweden, United Kingdom, Iceland, Norway and Switzerland: face-to-face interviews were not possible. Therefore all interviews were conducted online with CAWI technique.

Recruitment for online interviews

■ In the EU

The online design in each country differed based on what was feasible within the fieldwork period.

Where possible, the online sample was based on a probabilistic sample design. Those recruited to the online survey were recruited through a single mobile frame or dual frame Random Digit Dialling (RDD) design. In this way the entire phone owning population in each country had a non-zero chance of being sampled. The choice of whether to use a single mobile frame or dual frame (mobile and landline) was dependent on the countries' landline infrastructure. Where the landline infrastructure is suitably advanced to support a significant minority of residential households with landline phones, a dual frame design is employed. The mix of mobile and landline sample is designed to maximise the representativeness of the responding sample. The RDD sample for both the mobile and landline sample is drawn from the country's telephone numbering plan. The landline sample frame is stratified by NUTS3 regions based on their prefix and the mobile by operator before a systematic random sample of numbers is generated proportional in size to the total generatable numbers in each stratum. Respondents were recruited using this sample design in **Belgium, Czechia, Estonia, Ireland, Latvia, Lithuania, Luxembourg, Malta, Portugal, Slovenia and Slovakia.**

In **Finland, Denmark, and Sweden** RDD samples were not used. Instead, the telephone sample was drawn from the country telephone directory. In these three countries the telephone directories offer comprehensive coverage of the phone-owning population, storing both landline and mobile phone numbers for each individual.

In **the Netherlands**, a proprietary panel called "Nipobase" was used, drawing a random sample from their panel. This panel uses a mix of probability-based sampling to recruit panellists and non-probabilistic approaches to maximise representation where the probability-based approach under-represents, such as in the younger age groups. Nipobase uses a mix of offline and online modes. Offline modes are typically RDD samples and online modes are typically recruitment via targeted websites and social media platforms.

■ Outside the EU:

In **the UK**, recruitment of respondents was carried out either via a face-to-face CAPI mode of data collection based on a clustered multistage random sample of addresses or via a postal invite to an online survey using a completely unclustered random sample of addresses.

In **Norway and Iceland**, stratified random samples were drawn from among probability-based samples. Recruitments were done using offline modes of data collection (telephone and postal) based on a probability sample design.

In **Switzerland** samples were randomly drawn from the pseudo-probabilistic sample of Demoscope, in which the frame for selecting households was based on a probability sample.

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Recruitment was done via the telephone directory – which lists landline numbers only in Switzerland, where landline coverage is very high. However the selection of individuals in the households to join the panel was not random, as demoscope recruited the first person who answered the phone in each household (therefore not implementing any random selection method within the household).

Please note that for some countries where the response rates were not sufficiently large to achieve the target sample size in the fieldwork period, we had to further supplement the samples drawn probabilistically (either face-to-face or phone-to-web) with non-probabilistic panels. This was effectively a 'last resort' option when no other probabilistic design was feasible.

In **Turkey**, the sample was supplemented with a randomly drawn sample from Kantar's LifePoints non-probabilistic sample panel. The LifePoints panel is Kantar's proprietary panel, used exclusively for Kantar clients and the lead source for Kantar's online work, generating close to 30 million completes per year. Members are recruited via online advertising across a wide range of web and social media sites. Adverts are placed with websites with very high footfalls to ensure maximised reach.

In **Lithuania**, from Norstat's panel. Norstat's Lithuania panel has around 20.000 active members recruited mostly in the last 6 months. Around 75% of respondents are recruited in probabilistically (via telephone or face-to-face), while the rest are recruited via online advertising and self-register.

Response rates

For each country a comparison between the responding sample and the universe (i.e. the overall population in the country) was carried out. Weights were used to match the responding sample to the universe on gender by age, region and degree of urbanisation. For European estimates (i.e. EU average), an adjustment was made to the individual country weights, weighting them up or down to reflect their age 15+ population as a proportion of the EU age 15+ population.

The response rates are calculated by dividing the total number of complete interviews with the number of all the addresses visited, apart from ones that are not eligible but including those where eligibility is unknown. The following type of addresses are classified as "not eligible" (hence not interviewed): address not found, address demolished, address empty, ineligible household (for examples non-nationals, households with no one aged 15 or over at home during the fieldwork period, etc), language difficulty. For the wave 95.2, the response rates, calculated by Kantar, are:

| | COUNTRIES | CAPI Response rates | CAWI Response rates |
|----|------------------------|------------------------|------------------------|
| BE | Belgium | | 26,7% |
| BG | Bulgaria | 46,0% | |
| CZ | Czechia | | 44,4% |
| DK | Denmark | 40,5% | 16,3% |
| DE | Germany | 19,5% | |
| EE | Estonia | | 32,4% |
| IE | Ireland | | 22,3% |
| EL | Greece | 27,1% | |
| ES | Spain | 31,3% | |
| FR | France | 29,7% | |
| HR | Croatia | 47,9% | |
| IT | Italy | 21,4% | |
| CY | Rep. of Cyprus | 44,0% | |
| LV | Latvia | | 20,9% |
| LT | Lithuania | | 27,5% |
| LU | Luxembourg | | 27,2% |
| HU | Hungary | 61,0% | |
| MT | Malta | 82,2% | 40,3% |
| NL | Netherlands | 65,2% | 48,1% |
| AT | Austria | 41,2% | |
| PL | Poland | 40,5% | |
| PT | Portugal | | 37,6% |
| RO | Romania | 55,2% | |
| SI | Slovenia | 48,2% | 42,0% |
| SK | Slovakia | 63,8% | 25,2% |
| FI | Finland | | 35,3% |
| SE | Sweden | | 35,7% |
| UK | United Kingdom | | 50,5% |
| TR | Turkey | 88,1% | |
| MK | North Macedonia | 67,3% | |
| ME | Montenegro | 94,1% | |
| RS | Serbia | 67,7% | |
| AL | Albania | 72,8% | |
| BA | Bosnia and Herzegovina | 76,5% | |
| IS | Iceland | | 26,5% |
| XK | Territory of Kosovo | 75,9% | |
| NO | Norway | | 46,9% |
| CH | Switzerland | | 8,8% |

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Margins of error

Readers are reminded that survey results are estimations, the accuracy of which - everything being equal - rests on the sample size and on the observed percentage. With samples of about 1,000 interviews, the real percentages vary within the following confidence limits:

Statistical Margins due to the sampling process
(at the 95% level of confidence)

various sample sizes are in rows

various observed results are in columns

| | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% | |
|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|---------------|
| | 95% | 90% | 85% | 80% | 75% | 70% | 65% | 60% | 55% | 50% | |
| N=50 | 6,0 | 8,3 | 9,9 | 11,1 | 12,0 | 12,7 | 13,2 | 13,6 | 13,8 | 13,9 | N=50 |
| N=500 | 1,9 | 2,6 | 3,1 | 3,5 | 3,8 | 4,0 | 4,2 | 4,3 | 4,4 | 4,4 | N=500 |
| N=1000 | 1,4 | 1,9 | 2,2 | 2,5 | 2,7 | 2,8 | 3,0 | 3,0 | 3,1 | 3,1 | N=1000 |
| N=1500 | 1,1 | 1,5 | 1,8 | 2,0 | 2,2 | 2,3 | 2,4 | 2,5 | 2,5 | 2,5 | N=1500 |
| N=2000 | 1,0 | 1,3 | 1,6 | 1,8 | 1,9 | 2,0 | 2,1 | 2,1 | 2,2 | 2,2 | N=2000 |
| N=3000 | 0,8 | 1,1 | 1,3 | 1,4 | 1,5 | 1,6 | 1,7 | 1,8 | 1,8 | 1,8 | N=3000 |
| N=4000 | 0,7 | 0,9 | 1,1 | 1,2 | 1,3 | 1,4 | 1,5 | 1,5 | 1,5 | 1,5 | N=4000 |
| N=5000 | 0,6 | 0,8 | 1,0 | 1,1 | 1,2 | 1,3 | 1,3 | 1,4 | 1,4 | 1,4 | N=5000 |
| N=6000 | 0,6 | 0,8 | 0,9 | 1,0 | 1,1 | 1,2 | 1,2 | 1,2 | 1,3 | 1,3 | N=6000 |
| N=7000 | 0,5 | 0,7 | 0,8 | 0,9 | 1,0 | 1,1 | 1,1 | 1,1 | 1,2 | 1,2 | N=7000 |
| N=7500 | 0,5 | 0,7 | 0,8 | 0,9 | 1,0 | 1,0 | 1,1 | 1,1 | 1,1 | 1,1 | N=7500 |
| N=8000 | 0,5 | 0,7 | 0,8 | 0,9 | 0,9 | 1,0 | 1,0 | 1,1 | 1,1 | 1,1 | N=8000 |
| N=9000 | 0,5 | 0,6 | 0,7 | 0,8 | 0,9 | 0,9 | 1,0 | 1,0 | 1,0 | 1,0 | N=9000 |
| N=10000 | 0,4 | 0,6 | 0,7 | 0,8 | 0,8 | 0,9 | 0,9 | 1,0 | 1,0 | 1,0 | N=10000 |
| N=11000 | 0,4 | 0,6 | 0,7 | 0,7 | 0,8 | 0,9 | 0,9 | 0,9 | 0,9 | 0,9 | N=11000 |
| N=12000 | 0,4 | 0,5 | 0,6 | 0,7 | 0,8 | 0,8 | 0,9 | 0,9 | 0,9 | 0,9 | N=12000 |
| N=13000 | 0,4 | 0,5 | 0,6 | 0,7 | 0,7 | 0,8 | 0,8 | 0,8 | 0,9 | 0,9 | N=13000 |
| N=14000 | 0,4 | 0,5 | 0,6 | 0,7 | 0,7 | 0,8 | 0,8 | 0,8 | 0,8 | 0,8 | N=14000 |
| N=15000 | 0,3 | 0,5 | 0,6 | 0,6 | 0,7 | 0,7 | 0,8 | 0,8 | 0,8 | 0,8 | N=15000 |
| | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% | |
| | 95% | 90% | 85% | 80% | 75% | 70% | 65% | 60% | 55% | 50% | |

