



# Your Scientific Reputation and Being a Responsible Member of Society

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April 2022



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# Housekeeping:

## Zoom Etiquette:

- Silence personal devices.
- Stay muted when not talking.
- Set up in a quiet location.
- Remain attentive. Avoid checking email/phone/web.
- Use the Chat function to ask questions or get technical help.
- Use your full name, not an alias.

## Receiving credit for attendance:

To satisfy the [NIH Requirement for Instruction in the Responsible Conduct of Research](#), the following are required in order to receive credit for attendance:



**Attend the full 90 minutes of the training.** Attending any 8 out of the 9 RCR seminars we offer will satisfy the NIH requirement.



**Keep your video camera on throughout the session.** NIH requirements for RCR training specify face-to-face discussion.



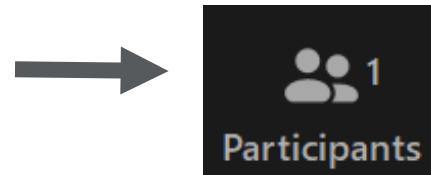
**Participate interactively throughout the session.** Participate in discussions, respond to polls, and sign the attendance sheet (link will be distributed in the Chat).



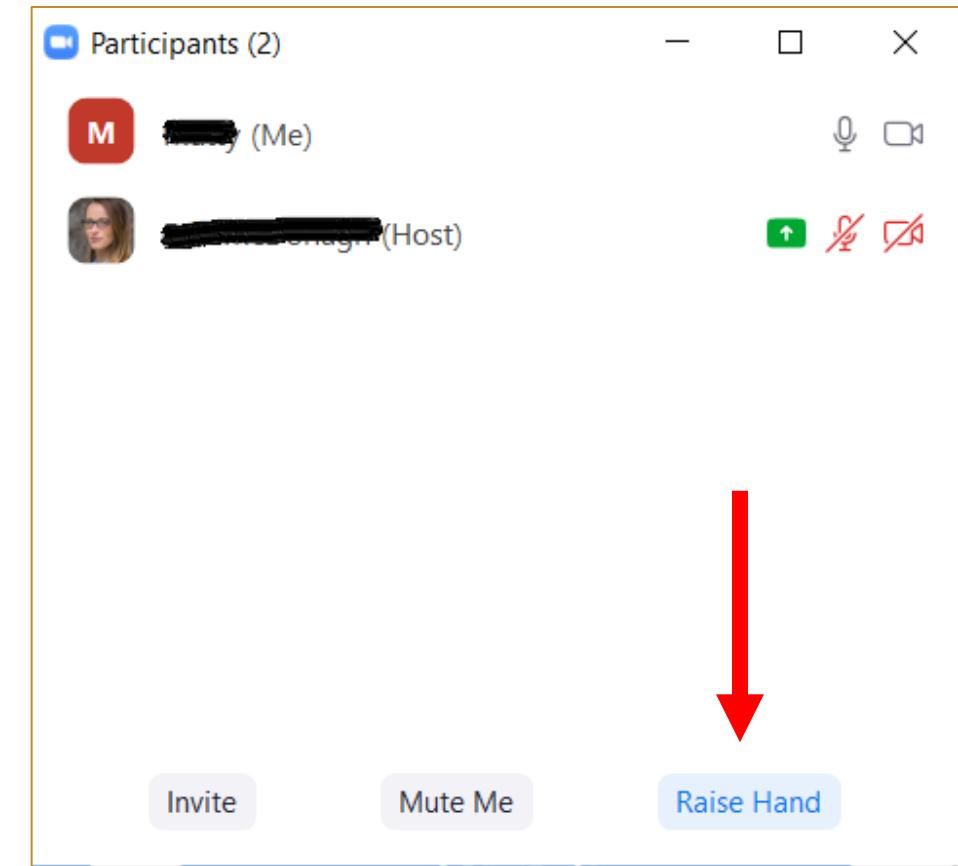
# Raise your Hand to participate in discussions:

In order to participate in discussions, raise your hand. **Try it now!**

- Click “**Participants**” at the bottom of your screen.



- Click “**Raise Hand**” in the popup window.
- Click “**Lower Hand**” to stop raising your hand.



# Objectives:

- Explain why a good scientific reputation is important in academia
- Describe the factors that contribute to a good scientific reputation
- Identify the components to being a responsible member of the scientific community
- Describe threats that may harm one's scientific reputation, and responses to challenges that you can implement
- Appreciate the importance of scientific integrity to the general public





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# Poll / Discussion: Public Perception – 10 min

- How do you think the public perceives the scientific community?
- How has public perception changed over time - prepandemic?
  - Lets talk about COVID and public preception at the end ...
- Does the public perceive a problem with scientific misconduct?
- Do you think the public supports government funding of scientific research?



# The 10 Most Prestigious Jobs in America, Harris Poll's List, September 2014

	<b>MORE PRESTIGE (NET)</b>	Has a great deal of prestige	Has prestige	<b>LESS PRESTIGE (NET)</b>	Has not that much prestige	Not at all prestigious
<b>Doctor %</b>	<b>88</b>	45	44	<b>12</b>	8	4
<b>Military officer %</b>	<b>78</b>	34	44	<b>22</b>	16	6
<b>Firefighter %</b>	<b>76</b>	32	44	<b>24</b>	17	6
<b>Scientist %</b>	<b>76</b>	30	46	<b>24</b>	19	5
<b>Nurse %</b>	<b>70</b>	24	46	<b>30</b>	23	7
<b>Engineer %</b>	<b>69</b>	18	52	<b>31</b>	24	7
<b>Police officer %</b>	<b>66</b>	21	44	<b>34</b>	25	10
<b>Priest/Minister/Clergy %</b>	<b>62</b>	21	41	<b>38</b>	26	12
<b>Architect %</b>	<b>62</b>	13	49	<b>38</b>	29	9
<b>Athlete %</b>	<b>60</b>	23	38	<b>40</b>	25	15
<b>Teacher %</b>	<b>60</b>	21	40	<b>40</b>	30	10
<b>Lawyer %</b>	<b>60</b>	16	44	<b>40</b>	26	15

# Pew Research Center Surveys

- Science has long been esteemed among citizens and professionals
- Americans recognize accomplishments of scientists in key fields
- Confidence in scientists has remained stable for 40 years

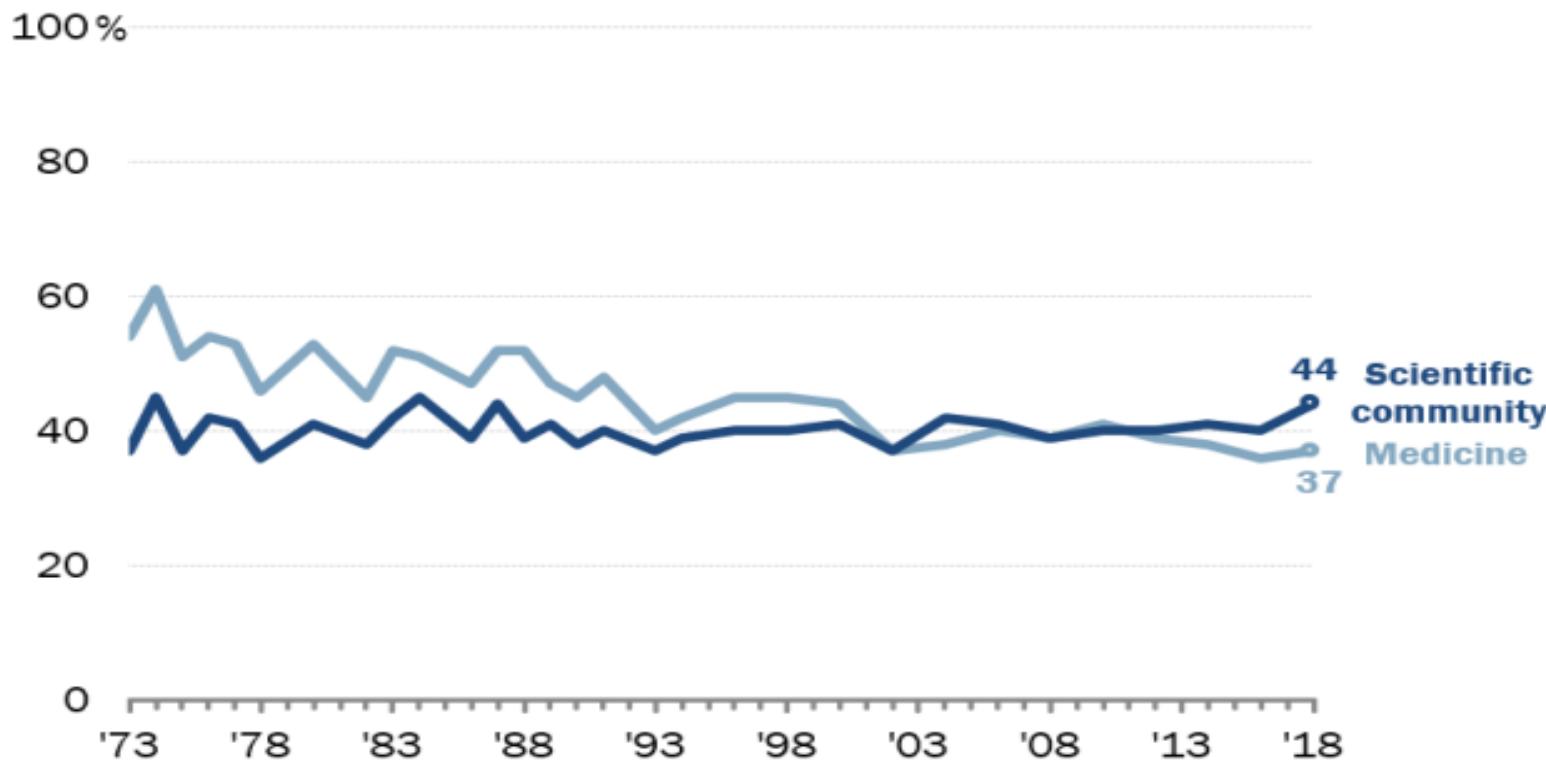
<https://www.pewresearch.org/science/2019/08/02/trust-and-mistrust-in-americans-views-of-scientific-experts/>

<https://www.pewresearch.org/fact-tank/2019/03/22/public-confidence-in-scientists-has-remained-stable-for-decades/>



# Confidence in the leaders of the scientific community has been stable since the 1970s

% of U.S. adults who say they have a great deal of confidence in the people running each of these institutions

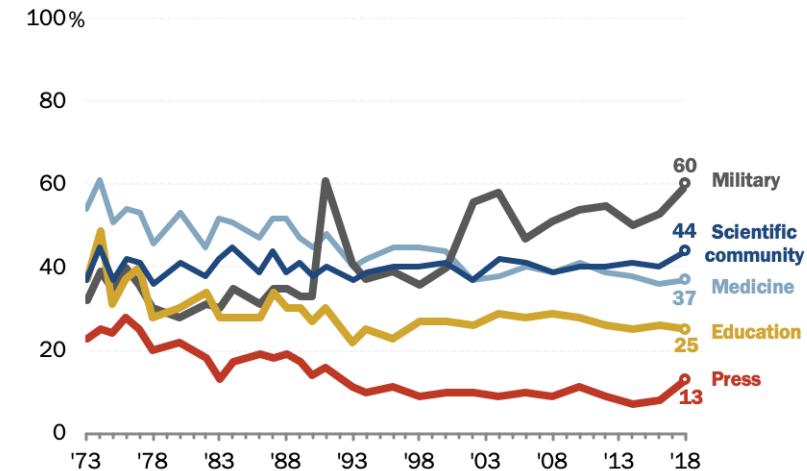


Note: Respondents who gave other responses or who did not give an answer are not shown.  
Source: General Social Surveys, NORC.

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Confidence in leaders of the military has gone up, while confidence in some other institutions is declining

% of U.S. adults who say they have a great deal of confidence in the people running each of these institutions



Note: Respondents who gave other responses or who did not give an answer are not shown.  
Source: General Social Surveys, NORC.

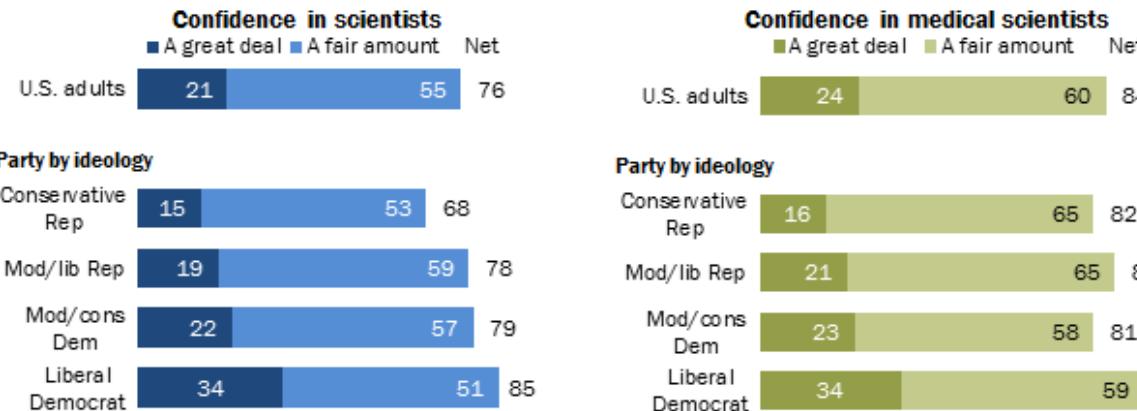
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## Broad confidence in scientists to act in the public interest among all political groups

% of U.S. adults who say they have \_\_\_\_ of confidence in scientists/medical scientists to act in best interests of public



Note: Views of "scientists" asked of random two-thirds of sample, N=3,014; views of "medical scientists" asked of random one-third of sample, N=1,549. Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean toward a political party are not shown. Those saying not too much, no confidence at all, or no answer are not shown.

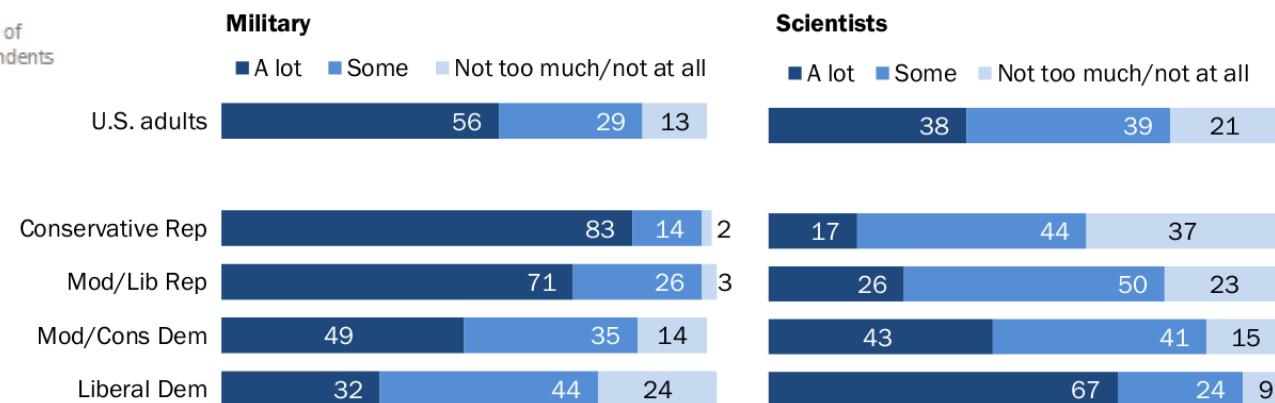
Source: Survey conducted May 10-June 6, 2016.

"The Politics of Climate"

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## U.S., there are wide political differences in trust in military and scientists

adults who trust each group \_\_\_\_ to do what is right for the United States



Note: Republicans and Democrats include independents and others who lean to each of the parties. Respondents who did not give an answer are not shown.

Source: International Science Survey 2019-2020. Q2b, d.

"Science and Scientists Held in High Esteem Across Global Publics"

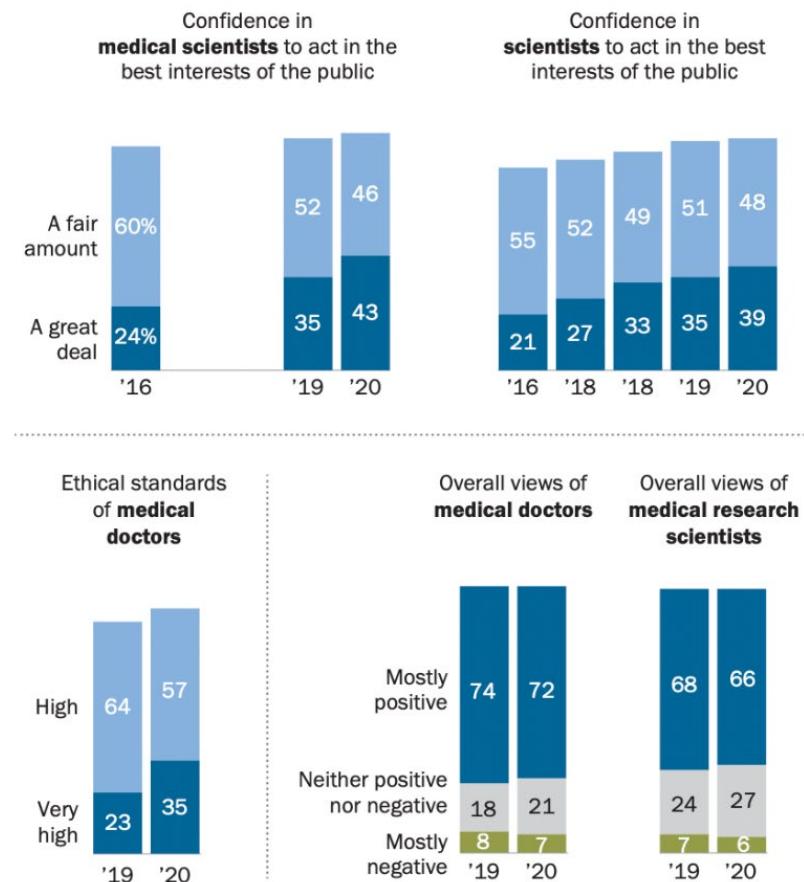
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## Americans express growing confidence in medical scientists since the COVID-19 outbreak

% of U.S. adults



Note: Respondents who gave other responses or who did not give an answer are not shown.

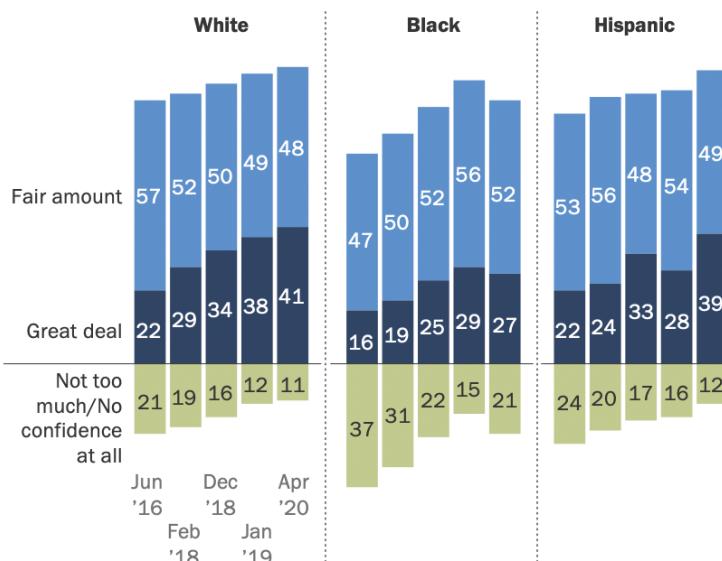
Source: Surveys conducted April 20-26 and April 29-May 5, 2020.

"Trust in Medical Scientists Has Grown in U.S., but Mainly Among Democrats"

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## Lower confidence in scientists among Black adults than White and Hispanic adults

% who have a \_\_\_ of confidence in scientists to act in the best interests of the public



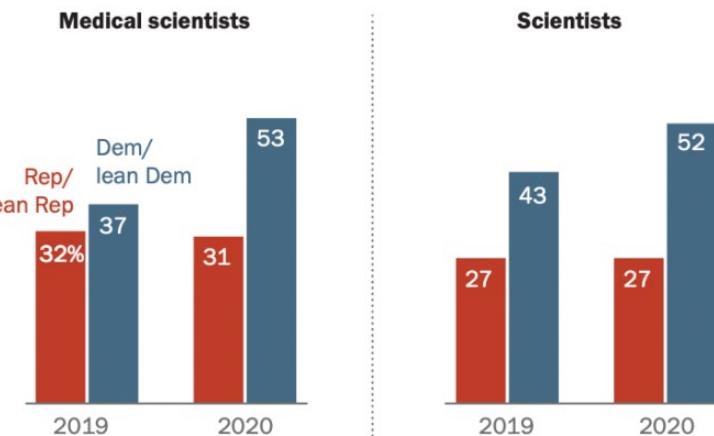
Note: White and Black adults include those who report being only one race and are not Hispanic. Hispanics are of any race.

Source: Survey of U.S. adults conducted April 20-26, 2020.

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## Growing partisan differences over trust in medical scientists and scientists since the COVID-19 outbreak

% of U.S. adults who have a great deal of confidence in each group to act in the best interests of the public



Note: Respondents who gave other responses or who did not give an answer are not shown.

Source: Survey conducted April 20-26, 2020.

"Trust in Medical Scientists Has Grown in U.S., but Mainly Among Democrats"

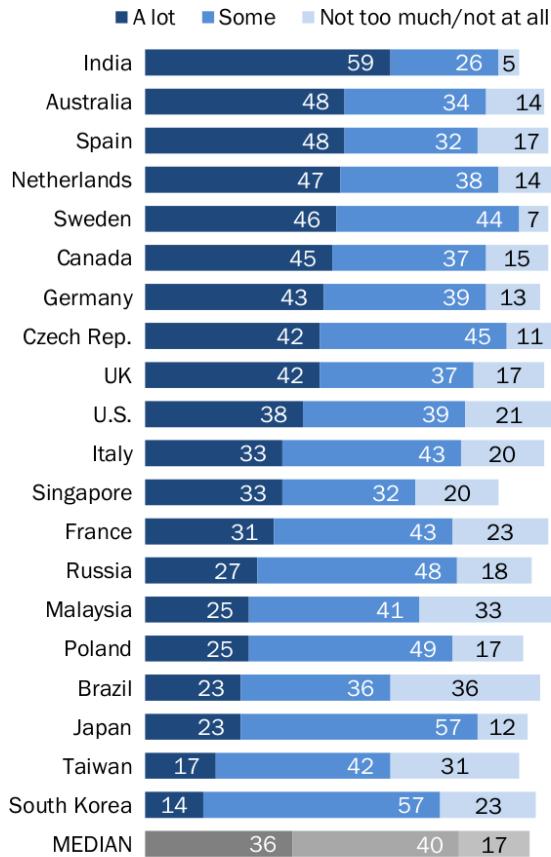
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## Majorities have at least some trust in scientists to do what is right

% who say they have \_\_\_ trust in scientists to do what is right for (survey public)



Note: Respondents who did not give an answer are not shown.

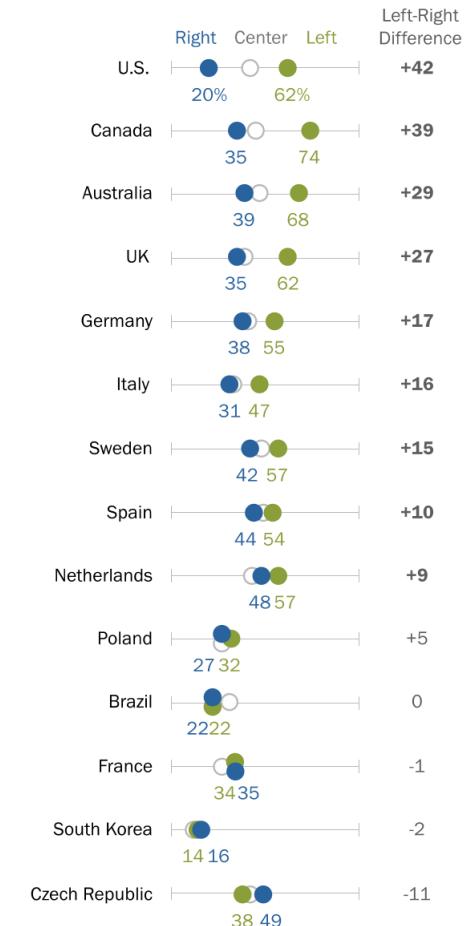
Source: International Science Survey 2019-2020. Q2d.

"Science and Scientists Held in High Esteem Across Global Publics"

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## Those on the political right often less trusting of scientists than those on left

% who trust scientists **a lot** to do what is right for (survey public)



Note: Statistically significant differences in **bold**. Respondents who gave other responses or did not give an answer are not shown.

Source: International Science Survey 2019-2020. Q2d.

"Science and Scientists Held in High Esteem Across Global Publics"

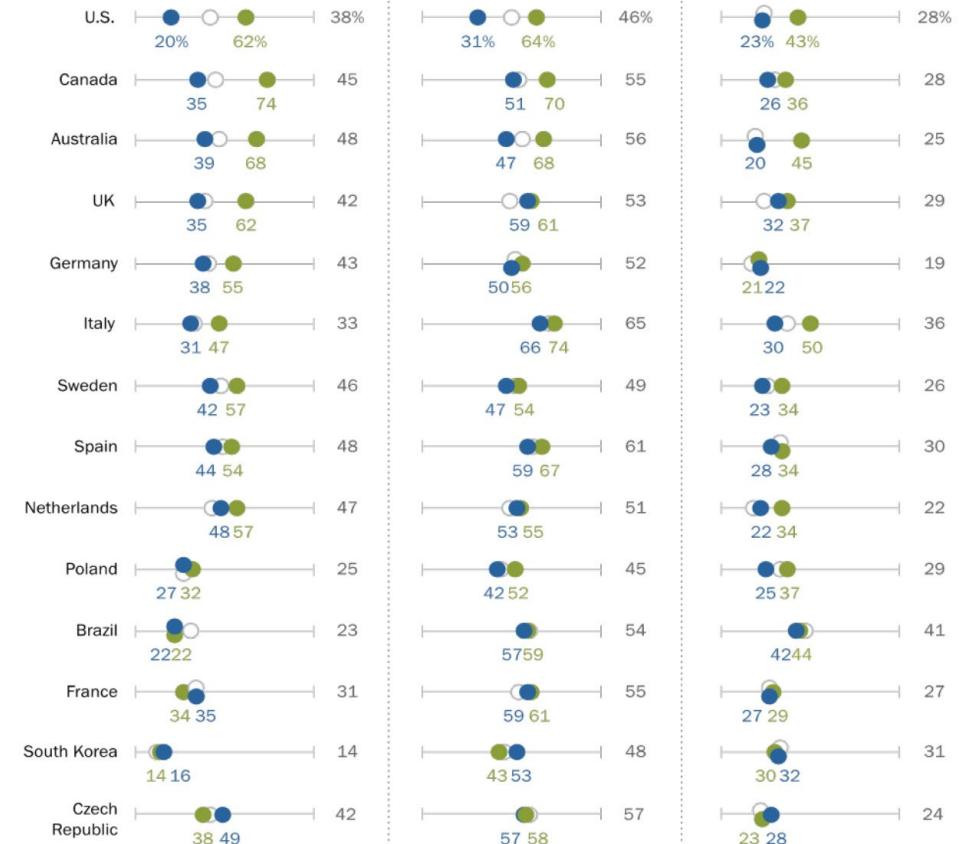
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## In many places, modest differences by ideology in views of scientists' judgments, value of experts

% who say ...

### Have a lot of trust in scientists to do what is right

### Scientists make judgments based solely on the facts



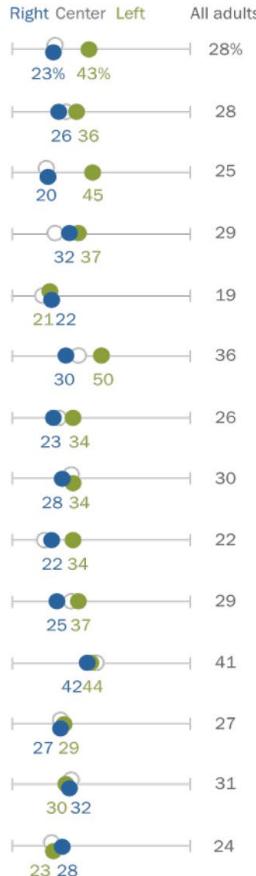
Note: Respondents who gave other responses or did not give an answer are not shown.

Source: International Science Survey 2019-2020. Q2d, Q15 & Q43.

"Science and Scientists Held in High Esteem Across Global Publics"

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To solve problems, (survey public) should rely more on people who are considered experts



Note: Respondents who gave other responses or did not give an answer are not shown.

Source: International Science Survey 2019-2020. Q2d, Q15 & Q43.

"Science and Scientists Held in High Esteem Across Global Publics"

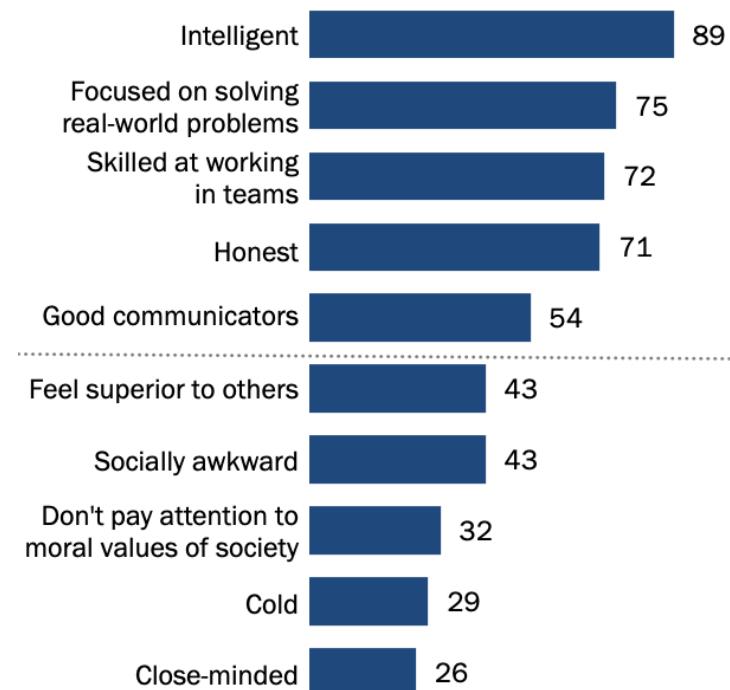
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## **Majorities of Americans see scientists as intelligent, focused on solving real-world problems**

*% of U.S. adults who say each of the following describes research scientists well*



Note: Respondents who gave other responses or who did not give an answer are not shown.

Source: Survey conducted Jan. 7-21, 2019.

"Trust and Mistrust in Americans' Views of Scientific Experts"

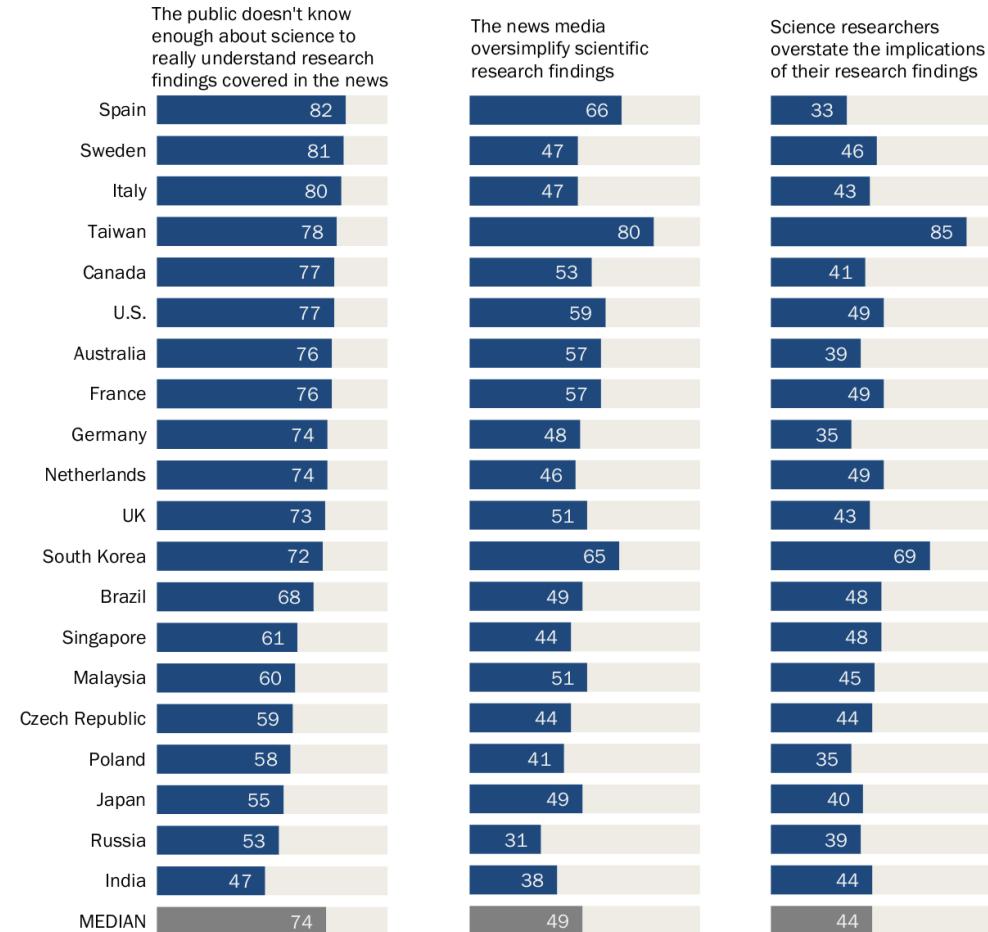
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## **Majorities say the public doesn't know enough about science to understand research findings covered in the news**

% who say each of the following is a problem with news reports of scientific research findings



Note: Respondents who gave other responses or did not give an answer are not shown.

Source: International Science Survey 2019-2020, Q41a-c.

"Science and Scientists Held in High Esteem Across Global Publics"

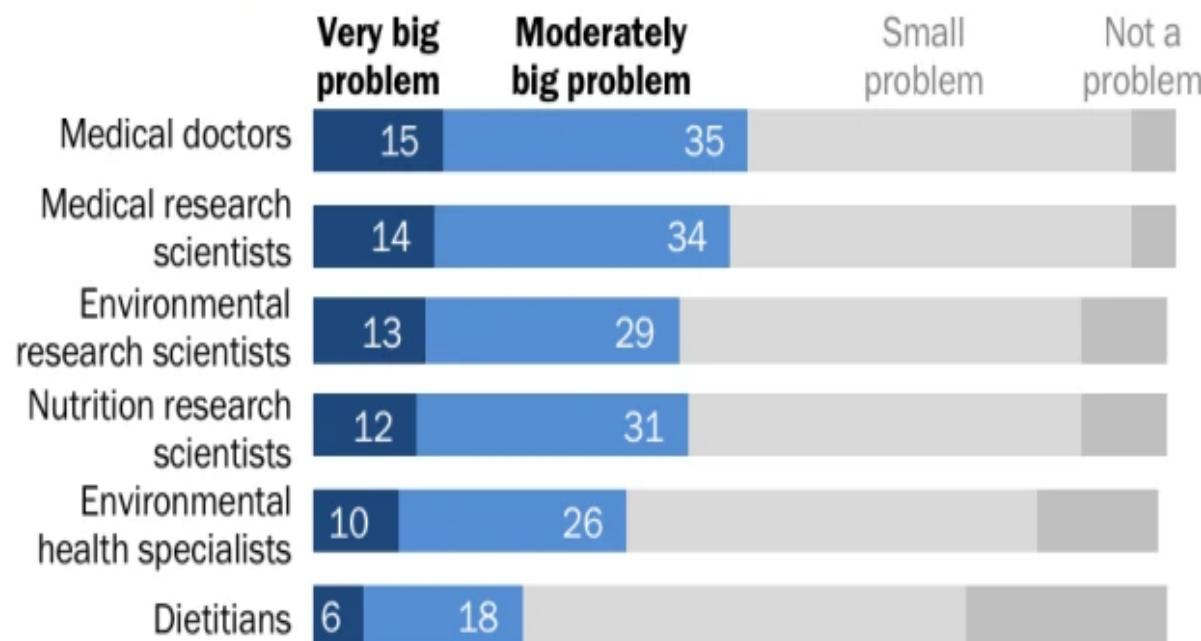
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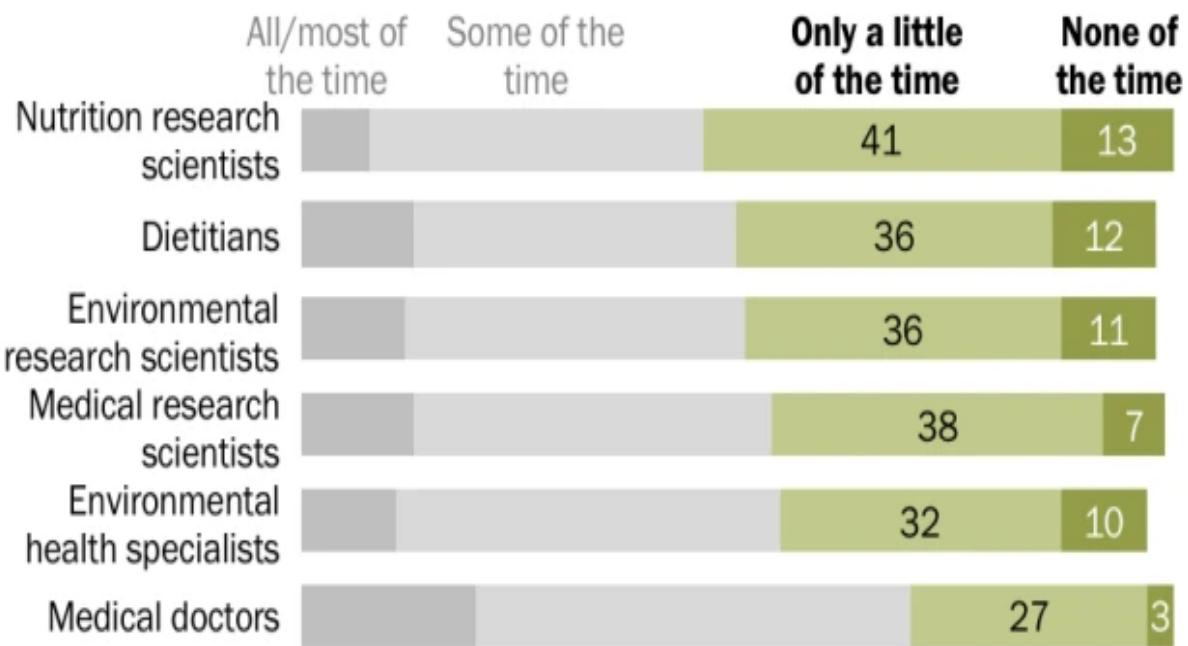
## The public is divided over whether misconduct by medical professionals is a big problem

% of U.S. adults who say misconduct among each group is a ...



## Many Americans are skeptical that scientists who engage in misconduct face serious consequences

% of U.S. adults who say when misconduct occurs, each group faces serious consequences ...



Note: Respondents who did not give an answer are not shown.

Source: Survey conducted Jan. 7-21, 2019.

"Trust and Mistrust in Americans' Views of Scientific Experts"

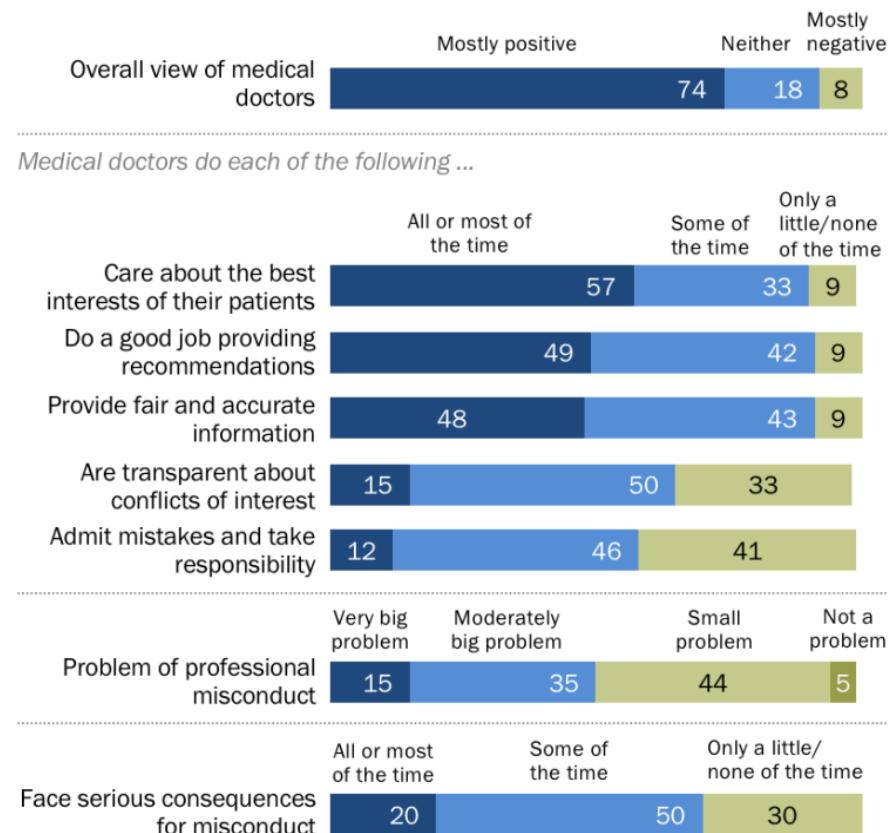
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## A majority of U.S. adults say medical doctors care about their patients' interests all or most of the time

% of U.S. adults who say the following about medical doctors



Note: Respondents who did not give an answer are not shown. "Neither" means "neither positive nor negative."

Source: Survey conducted Jan. 7-21, 2019.

"Trust and Mistrust in Americans' Views of Scientific Experts"

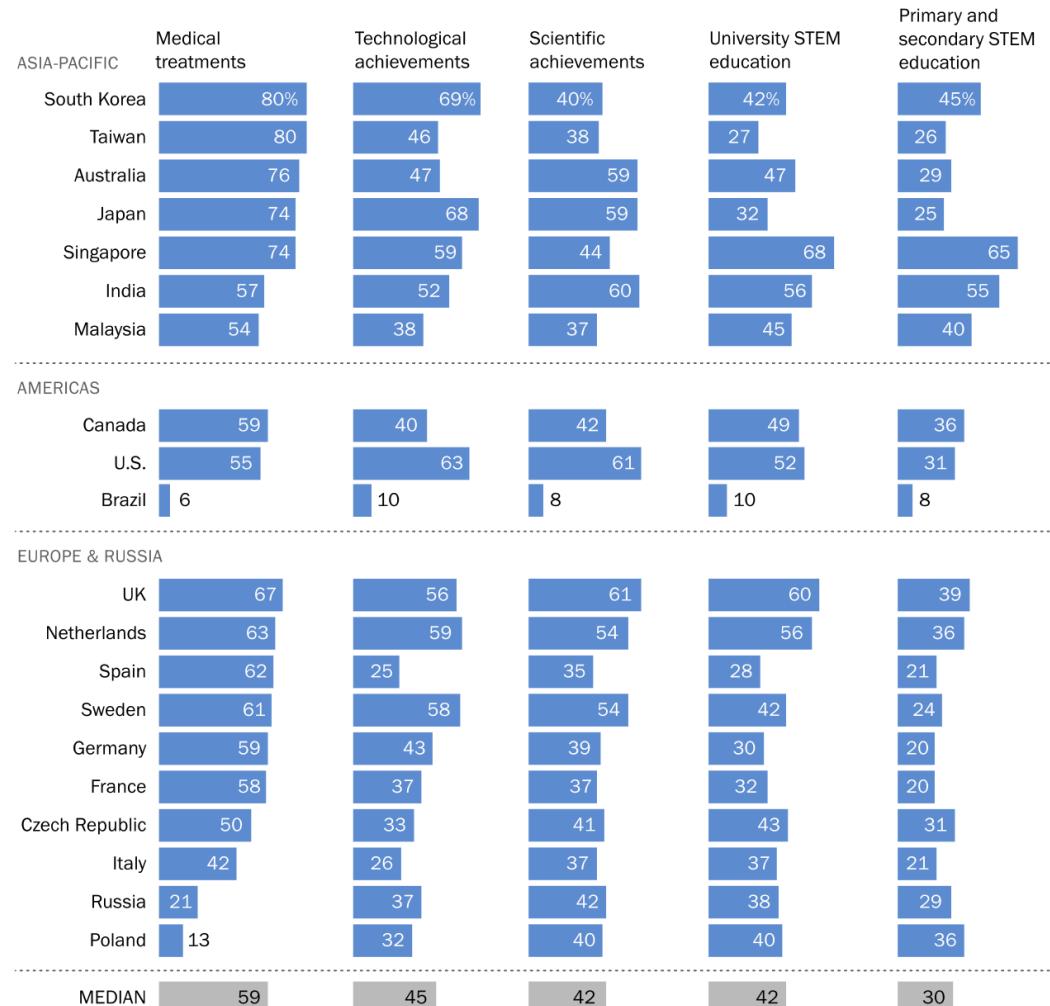
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## Prior to the pandemic, many saw medical treatments as a source of achievement

% who say (survey public) is **the best in the world or above average** in the following areas



Note: Respondents who gave other responses or did not give an answer are not shown.

Source: International Science Survey 2019-2020. Q4a, e-h.

"Science and Scientists Held in High Esteem Across Global Publics"

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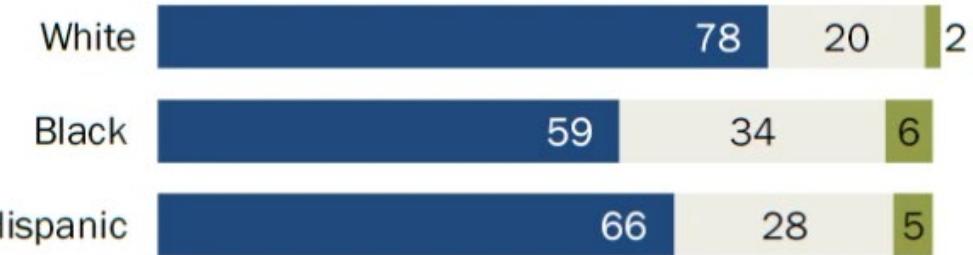
# Majority of Americans say science has a mostly positive impact on society

% of U.S. adults in each group who say science has had a \_\_\_\_\_ effect on society

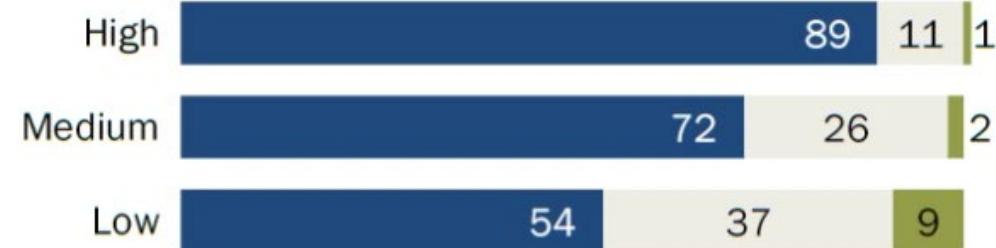
- Mostly positive
- Equal positive and negative
- Mostly negative



## Race/ethnicity



## Science knowledge



Note: Respondents who did not give an answer are not shown. See Methodology of report for details on index of science knowledge. Whites and blacks include those who report being only one race and are non-Hispanic. Hispanics are of any race.

Source: Survey conducted Jan. 7-21, 2019.

"Trust and Mistrust in Americans' Views of Scientific Experts"

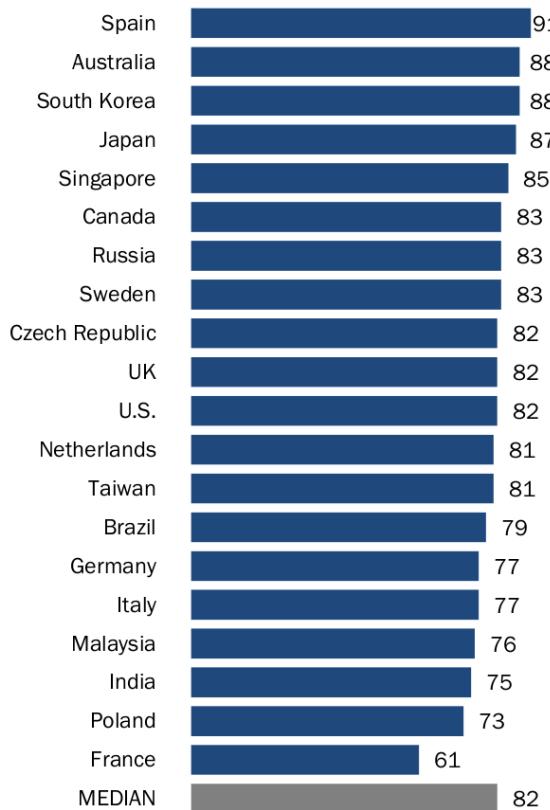
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## Large majorities say government investment in science is worthwhile

% who say government investments in scientific research aimed at advancing knowledge are usually worthwhile for society over time



Note: Respondents who gave other responses or did not give an answer are not shown.

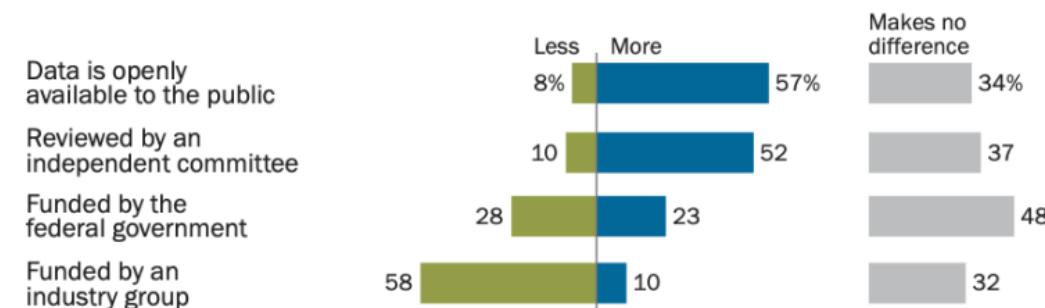
Source: International Science Survey 2019-2020, Q9a.

"Science and Scientists Held in High Esteem Across Global Publics"

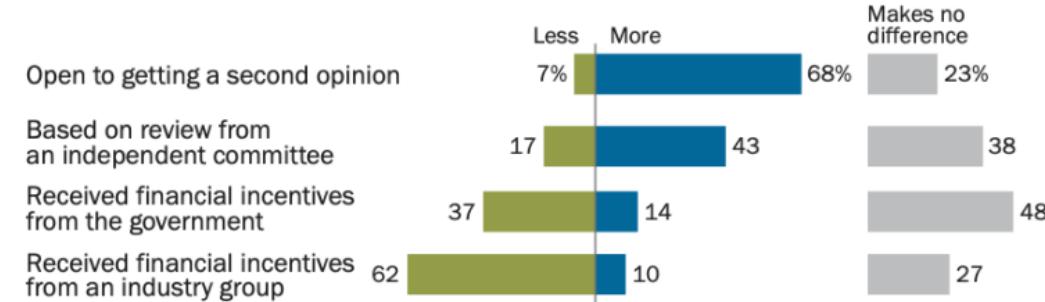
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## Majority of Americans say they are more apt to trust research when the data is openly available

% of U.S. adults who say when they hear each of the following, they trust scientific research findings ...



% of U.S. adults who say when they hear each of the following, they trust a science practitioner's recommendation ...



Note: Respondents who did not give an answer are not shown.

Source: Survey conducted Jan. 7-21, 2019.

"Trust and Mistrust in Americans' Views of Scientific Experts"

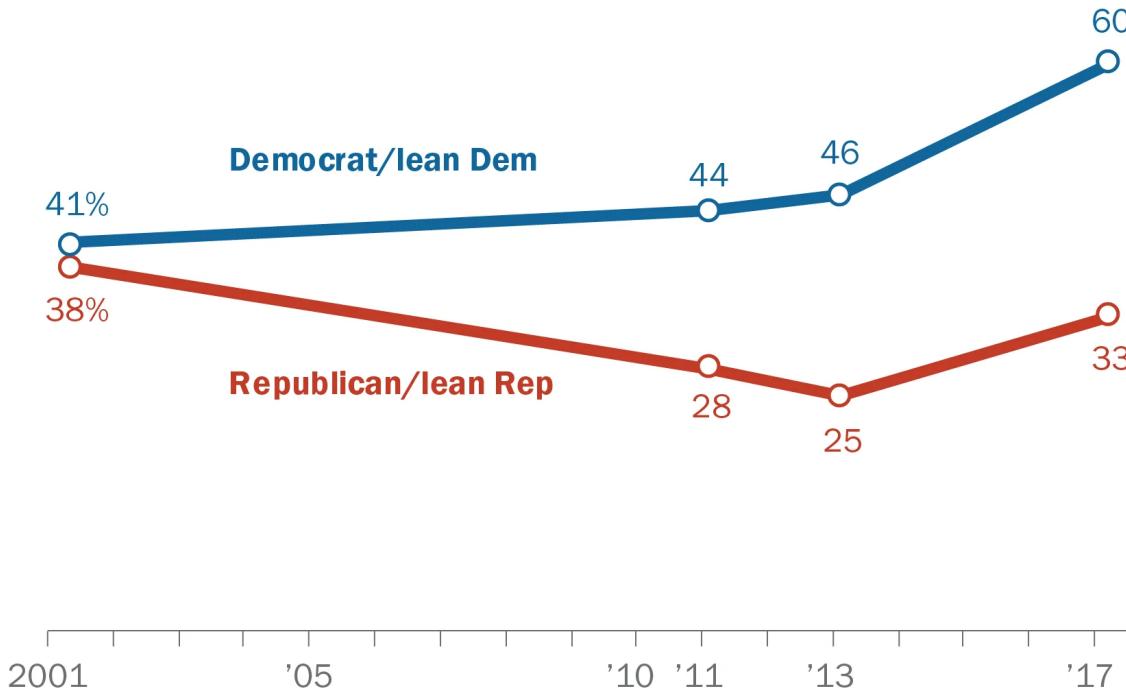
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## **Political divides over support for more scientific research funding have grown**

*% of U.S. adults who say they would increase federal spending for scientific research*



Note: Respondents who gave other responses or who did not give an answer are not shown.

Source: Survey conducted April 5-11, 2017.

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# Summary:

- Scientists and medical professionals are held in high regard
- There is a growing public awareness of scientific misconduct and conflict of interest
- The public supports government (i.e.: taxpayer) funding of scientific research
- Consequently, as scientists, we have a responsibility to protect this public support and good reputation



Given the importance of federal and other funding to support our work, it's ever-more important to maintain one's scientific reputation.

## But just what is a *Scientific Reputation*?

- Quantitative as well as Qualitative Factors
- Foundation is elusive
- Not immediate: acquired over your career.
  - Analogous to compound interest
- Very easy to lose, and once gone, nearly impossible to recover
- Do achievements stand apart from personality?



# Discussion – 10 min

- What “objective” factors do you use to evaluate a person’s scientific reputation?
- What “subjective” factors do you use to evaluate a person’s scientific reputation?
- In what ways can scientific reputation HELP one’s academic career?
- In what ways can scientific reputation HURT one’s academic career?



To raise your hand...

- Click “**Participants**” at the bottom of your screen.
- Click “**Raise Hand**” in the pop-up window (click “Lower Hand” when done).



Please sign the attendance sheet now  
by clicking on the link in the chat



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# The four “pillars” of scientific reputation, circa 2002

1. Published papers along with their impact factor and citations received
2. Research grants received
3. Patents filed and commercialized
4. Excellent interpersonal and communications skills, along with ability to travel widely (appeal to broad audience)



# Pillars of Scientific Reputation, circa 2015

- Quality of one's scientific work
- Relationships with fellow scientists
- Presence in the broader scientific community
- Willingness to do what it takes to protect and promote one's personal brand
  - » Philip Bourne, Associate Director for Data Science, NIH

# Reputation not just influenced by individual-level factors...what about *environment*?

- How may an individual's reputation be influenced by the institution where he/she works?
- How may an individual's reputation be related to the reputation of his/her research group?



# Impact of environment on scientific reputation

	Beneficial Impact	Neutral or Harmful Impact
Institution	Larger, more prestigious name may help	Smaller, less well-known institutions
	Availability of infrastructure support, financial support may help	Publicity or politics regarding treatment of faculty
Research Group	Availability of mentors with track record of success in funding, publications	Reputation of mentors or others in group as being hypercompetitive
	Diverse skills in group members	No prior track record of research success (untested or unknown)

Be cognizant of environment impact on your personal scientific reputation and manage it wisely!



# Potential impact?

- Young scientists lacking (any) reputation can be negatively affected by social stratification
  - impetus to work with mentors or groups with a “good” reputation, but potentially a bad fit
- Scientists want to improve visibility, in effect “gaming” reputation
  - Employ self-citation strategies to boost reputation
  - Search engines (Google scholar) provide results according to citation measures, fostering this behavior
  - Rise of alternative metrics and social media with their influence on citations of publications

Petersen AM PNAS 2014



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# Is it just chance / luck or politics?

- Does a scientist's citation rate truly reflect meritorious research or does it reflect his/her current reputation?
- How do you find the meritorious research? There's so much to read!
  - *Scientific community acts as a collective search engine to cull out most important material*
  - *Is this efficient, or are gems being overlooked?*
- As a result, sometimes the rich do get richer

See article: "Are scientific reputations boosted artificially?" Philip Ball, Nature published online, May 6, 2011, doi 10.1038/news2011.270



# Reputation and impact in academic careers

- Developed mathematical framework to measure how a publication's citation rate depends on the *reputation of its central author*, in addition to its net citation count
- *Author reputation* measured by number of times his/her publications were referenced, also the number of appearances of his/her name in the literature. Did not account for publication quality.
- Findings:
  - Early in a paper's life cycle = author reputation drives citation count
  - After a certain “tipping point” = author reputation less of a driver in citation count

Petersen AM et al PNAS 2014



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# Alternative metrics to ponder:

- Citations: number of citations of all publications by an author
- Hirsch (h)-index: the largest number, or “h”, such that h publications have at least h citations
  - You have 15 total publications. Seven of them have been cited at least 7 times.
  - H-index=7



# Alternative metrics to ponder

- i10-index: total number of publications with at least 10 citations
  - You have 25 total publications. 17 of them have been cited 10 or more times.
  - I10-index → 17
- Relative Citation Ratio: A field-normalized metric that shows the scientific influence of one or more articles relative to the average NIH-funded paper. Considers other papers that are cited along with a given paper.
  - <https://icite.od.nih.gov>



# The Trouble with Medical Journals

- WHAT ARE JOURNALS FOR AND WHAT ARE THEIR VALUES
- FAILURE TO DEAL WITH CONFLICTS OF INTEREST
- MEDICAL JOURNALS ARE TOO CLOSE TO PHARMACEUTICAL COMPANIES
- LOVE AND HATE RELATIONSHIP WITH THE MEDIA
- RESEARCH FRAUD

Smith R. The trouble with medical journals. *J R Soc Med.* 2006;99(3):115–119.  
doi:10.1258/jrsm.99.3.115



# Scientific Misconduct

- J Cell Bio estimates that 20% of accepted papers contain some questionable data!
- Multiple major cases in the media in the last few decades
  - Poehlman – falsifying data in 10 HRT papers
  - Hwang – falsifying data in cloning

J. Cell Biol, 166, 11-15 (2004); Nature 434, 952-953 (2005)



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# How can you ensure your research laboratory or team environment will have an excellent reputation?

- Google (the tech giant) charged a team to find out
- **Project Aristotle**: included interviews with hundreds of employees and analysis of data about the people on >100 active teams at the company
- The best teams:
  - Respect one another's emotions
  - Mindful that all members contribute to the conversation equally
  - Who is in a team not as important
- **“Psychological safety”**: a model of teamwork where members have a shared belief that it is safe to take risks and share a range of ideas without the fear of being humiliated.
  - Drives team effectiveness because it inspires a learning culture. This is beneficial to any organization.



# Other important Team Dynamics

- **Dependability:** counting on team members to perform tasks effectively, and to offer help
- **Structure and clarity:** in roles, responsibility, accountability
- **Meaning of work:** are goals important to all members of team?
- **Impact of work:** does work matter, or is it contributing to a higher-order goal?



# How to build and maintain a scientific reputation on an individual level

[“Ten simple rules for building and maintain a scientific reputation”, P. Bourne, V. Barbour, PLOS computational biology, June 2011, Vol. 7 Issue 6 e1002108]

- Think before you act and accept criticism gracefully
  - email etiquette
- Do not ignore people below you on the career ladder
  - “golden rule”...be a listener
- Diligently check everything you publish and take publishing seriously
  - Authorship must be earned



- Always declare conflicts of interest
  - Would you like to see it on front page of paper?
  - Opt out from reviewing a competitor's work
- Do your share for the community
  - Bring something to the table
  - Share your data
- Do not commit to tasks you cannot complete
  - Become a sponsor



- Do not write poor reviews of grants and papers
  - Honesty with tact
- Do not write references for people who do not deserve it
  - Will always end poorly
- Never plagiarize or doctor data
  - Backup data and recheck statistics



# Scientific Reputation in the Era of Social Distancing and Zoom Meetings

- Conferences have moved to recorded presentations for meetings
- During a conference, the presenter had uploaded the wrong version of the presentation, which included the presenter cursing at the computer in frustration for not recording properly
- The presenter was mortified, but could not stop the recording



# Group Discussion – 10 min

- How does electronic formats change the metrics of scientific reputations?
- Zoom meetings? Lab meetings? Professional meetings?
- New risks?
- New advantages?



# Scientific Reputation and COVID-19

## ***Two Huge Covid-19 Studies Are Retracted After Scientists Sound Alarms***

<https://www.nytimes.com/2020/06/04/health/coronavirus-hydroxychloroquine.html>

### NEJM Reply

On May 1, 2020, we published “Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19,”<sup>1</sup> a study of the effect of preexisting treatment with angiotensin-converting enzyme (ACE) inhibitors and angiotensin-receptor blockers (ARBs) on Covid-19. This retrospective study used data drawn from an international database that included electronic health records from 169 hospitals on three continents. Recently, substantive concerns have been raised about the quality of the information in that database. We have asked the authors to provide evidence that the data are reliable. In the interim and for the benefit of our readers, we are publishing this Expression of Concern about the reliability of their conclusions. Studies of ACE inhibitors and ARBs in Covid-19 can play an important role in patient care. We encourage readers to consult two other studies we published on May 1, 2020, that used independent data to reach their conclusions.<sup>2,3</sup>

### Authors Reply

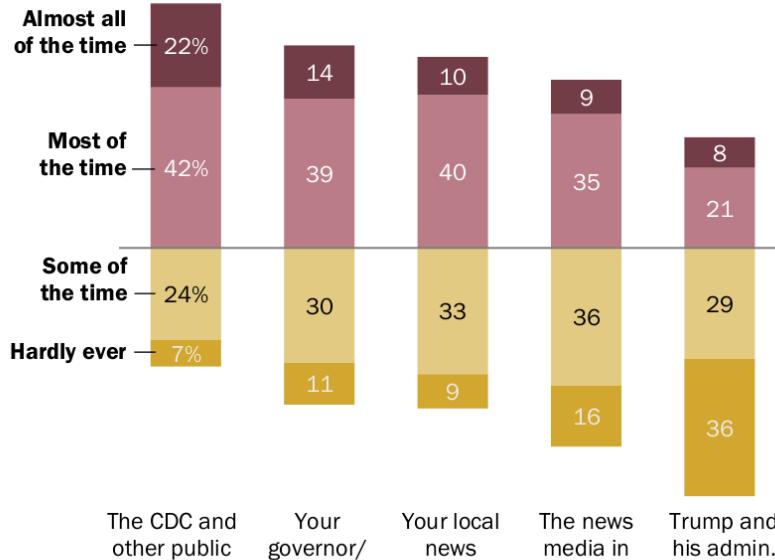
Because all the authors were not granted access to the raw data and the raw data could not be made available to a third-party auditor, we are unable to validate the primary data sources underlying our article, “Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19.”<sup>1</sup> We therefore request that the article be retracted. We apologize to the editors and to readers of the *Journal* for the difficulties that this has caused.



# COVID-19 Management

## Majority says CDC and public health organizations largely getting the facts right about coronavirus

% of U.S. adults who say each gets the facts right when it comes to the coronavirus outbreak ...



Note: Respondents who did not give an answer not shown.

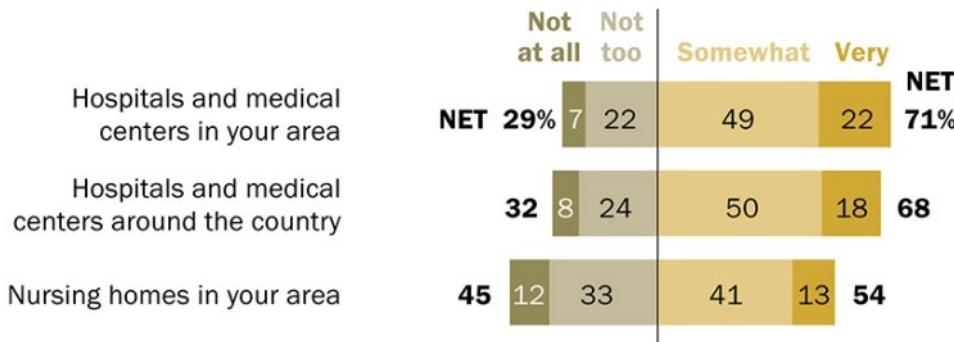
Source: Survey of U.S. adults conducted June 4-10, 2020.

"Three Months In, Many Americans See Exaggeration, Conspiracy Theories and Partisanship in COVID-19 News"

PEW RESEARCH CENTER

## Around seven-in-ten Americans are confident that hospitals can treat seriously ill people during COVID-19 outbreak

% of U.S. adults who are \_\_\_\_\_ confident in each to handle the medical needs of people who are seriously ill during the coronavirus outbreak



Note: Don't know responses not shown. Subtotals may not add to net totals due to rounding.

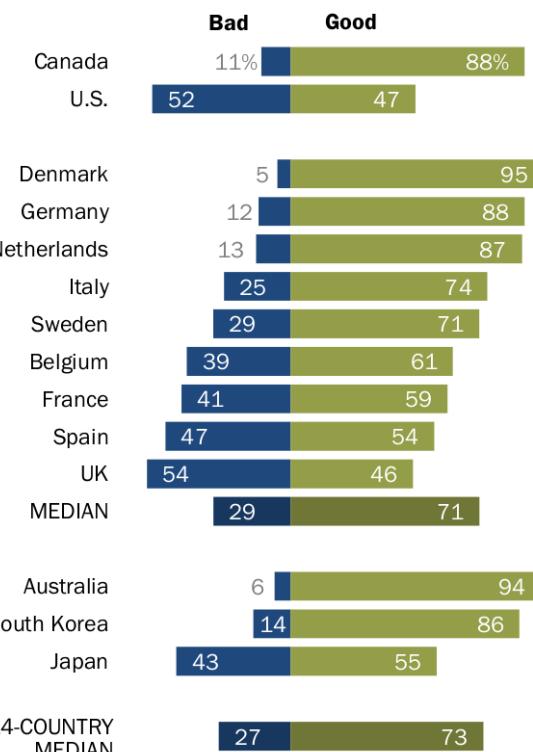
Source: Survey of U.S. adults conducted March 19-24, 2020.

"Worries About Coronavirus Surge, as Most Americans Expect a Recession – or Worse"

PEW RESEARCH CENTER

More think their country has handled COVID-19 well, with the exceptions of the U.S. and UK

% who say their own country has done a \_\_\_ job dealing with the coronavirus outbreak



Note: Those who did not answer are not shown. In Australia and Canada, the question was asked about "COVID-19." In Japan, it was asked about "novel coronavirus," and in South Korea, it was asked about "Corona19."

Source: Summer 2020 Global Attitudes Survey, Q10c.

"Most Approve of National Response to COVID-19 in 14 Advanced Economies"

PEW RESEARCH CENTER

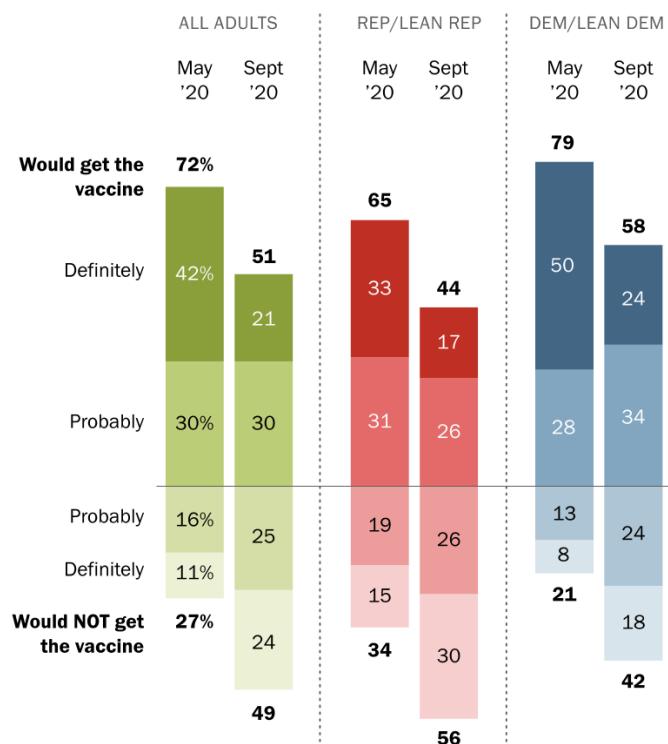


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# COVID-19 Vaccination

## Drop in share of Americans who say they would get a COVID-19 vaccine if it were available to them today

% of U.S. adults who say if a vaccine to prevent COVID-19 were available today, they ...



Note: Respondents who did not give an answer are not shown.

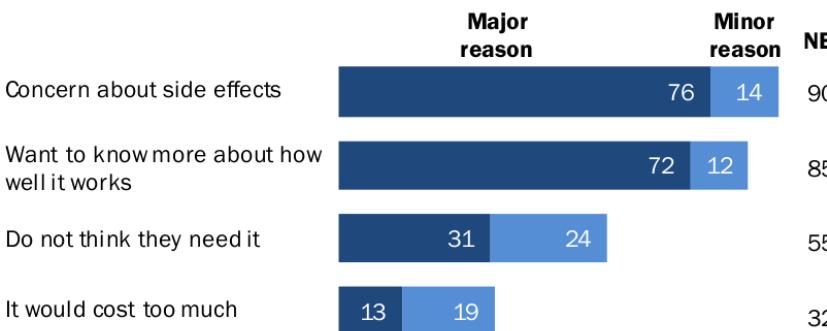
Source: Survey conducted Sept. 8-13, 2020.

"U.S. Public Now Divided Over Whether To Get COVID-19 Vaccine"

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## Concern over side effects, uncertainty about effectiveness top reasons for those not planning to get a COVID-19 vaccine

Among U.S. adults who say they *probably/definitely would not* get a vaccine to prevent COVID-19, % who say each of the following is a major/minor reason why



Note: Respondents who gave other responses or did not give an answer are not shown.

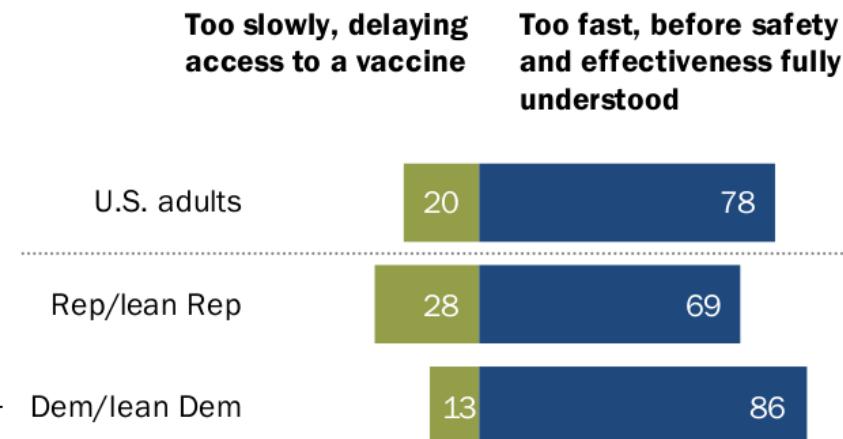
Source: Survey conducted Sept. 8-13, 2020.

"U.S. Public Now Divided Over Whether To Get COVID-19 Vaccine"

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## Public concern over moving too fast on COVID-19 vaccine approval process

% of U.S. adults who say they are more concerned that approval of a COVID-19 vaccine will move ...



Note: Respondents who did not give an answer are not shown.

Source: Survey conducted Sept. 8-13, 2020.

"U.S. Public Now Divided Over Whether To Get COVID-19 Vaccine"

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# Group Discussion – 10 min

- How do these examples impact the overall impression of scientific integrity?
- How do we balance the need for rapid information in a novel pandemic with ensuring scientific standards?
- How did the academic system fail or succeed in each of cases?
- How does faith in the scientific community effect public health projects?



# Parting comments

“Researchers, being people, have the frailties of all human beings. Some are tempted to indulge in ad-hominem personal attacks, reputational smears, bullying, name-calling, and defamation. This unpleasant underside of research is more than embarrassing and confusing to the public. Uncivil behavior is an obstacle to progress in science.

Researchers continue to assume that civility in science will be learned passively by diffusion. This is a naïve assumption. We must actively teach our students and each other by example about responsibility and civility in relationships in research, not only because it makes life more pleasant but also because boorish behavior holds back the advancement of science and engineering.”

--Tee Guidotti, President of Sigma Xi, *The Scientific Research Society*, October 2016.

