

A nighttime photograph of a modern medical campus building with large glass windows and brick pillars, illuminated by warm lights. In the background, city lights and a parking lot are visible. A semi-transparent white box is centered over the image, containing the title text.

# Your Scientific Reputation and Being a Responsible Member of Society

Peter D Sottile, MD  
Spring 2025



University of Colorado  
Denver | Anschutz Medical Campus

# 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).



# Disclaimer

- This presentation is a lot harder and more charged in the last 3 months
- I will discuss politics and current events in a non-judgmental way
- This talk is designed to generate healthy reflection and academic debate about how we as scientists can protect our reputation in the currently political climate



# Objectives:

- Understand How Society views Scientist
- Describe the personal factors that contribute to a good scientific reputation
- Describe the environmental factors that contribute to a good scientific reputation
- Determine factors that contribute to a group's reputation
- Describe threats that may harm one's scientific reputation
- Appreciate the importance of scientific integrity to the general public





# Don't Look Up: Commentary on Reputation



# Poll / Discussion: Public Perception – 10 min

- How do you think the public perceives the scientific community?
- How has public perception changed over time: Pre-Pandemic? Peri-Trump v2.0
- Does the public perceive a problem with scientific misconduct?
- Do you think the public supports government funding of scientific research?



# 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/>

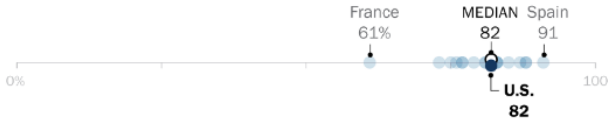
<https://www.pewresearch.org/fact-tank/2019/03/22/public-confidence-in-scientists-has-remained-stable-for-decades/>



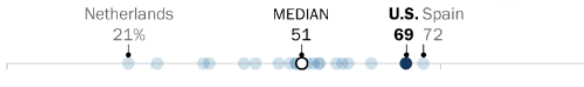
Nearly seven-in-ten Americans prioritize being a world leader in science

% who say ...

Government investments in scientific research are usually worthwhile



It is very important to be a world leader in scientific achievements



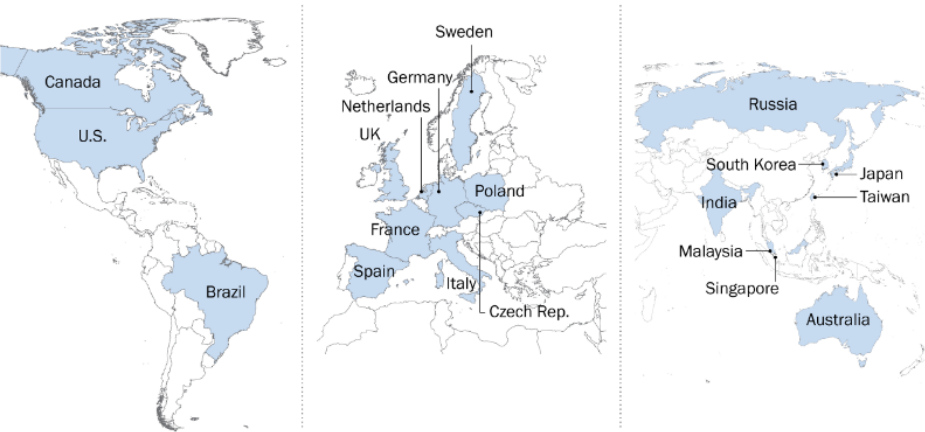
Their scientific achievements are the best in the world/above average



They have a lot of trust in scientists to do what is right for the survey public



EACH BLUE DOT REPRESENTS ONE OF THE 20 PUBLICS



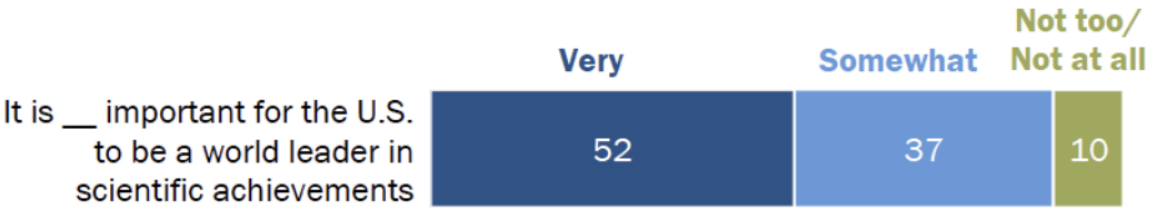
Note: Respondents who gave other responses or did not give an answer are not shown.  
Source: International Science Survey 2019-2020. Q2d, Q4a, Q7, Q9a.  
"Science and Scientists Held in High Esteem Across Global Publics"

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Most Americans view government investments in scientific research as worthwhile for society

Most Americans view government investments in scientific research as worthwhile for society

% of U.S. adults who say ...



Note: Respondents who did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Sept. 25-Oct. 1, 2023.  
"Americans' Trust in Scientists, Positive Views of Science Continue to Decline"

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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

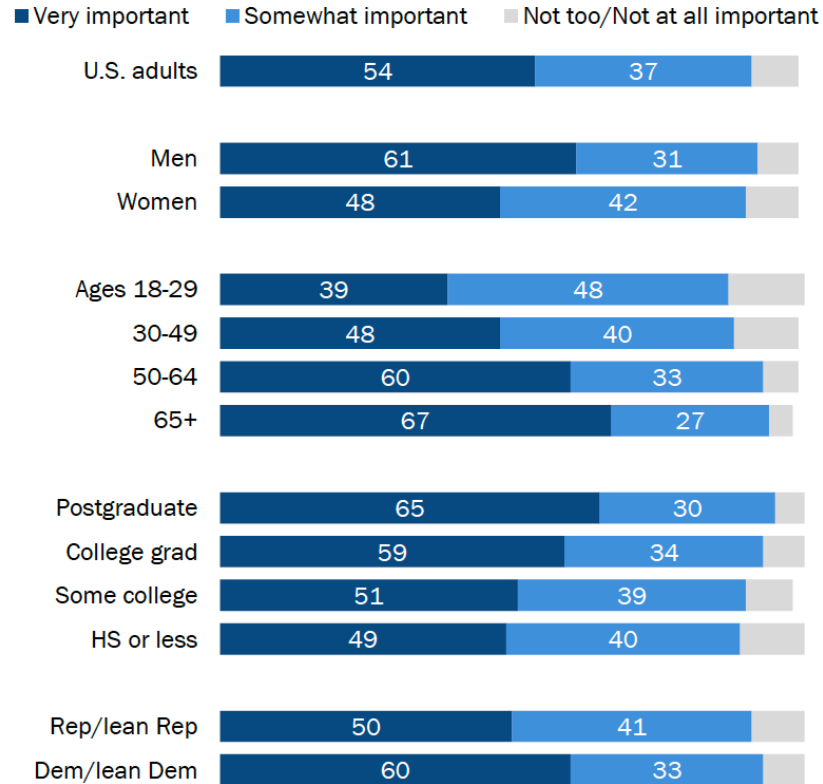


Note: Respondents who gave other responses or did not give an answer are not shown.  
Source: International Science Survey 2019-2020. Q4a, e-h.  
"Science and Scientists Held in High Esteem Across Global Publics"

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## 54% of Americans think it is very important the U.S. is a world leader in scientific achievements

% of U.S. adults who say that when thinking about all the important goals for the country, it is \_\_\_ for the U.S. to be a world leader in scientific achievements



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

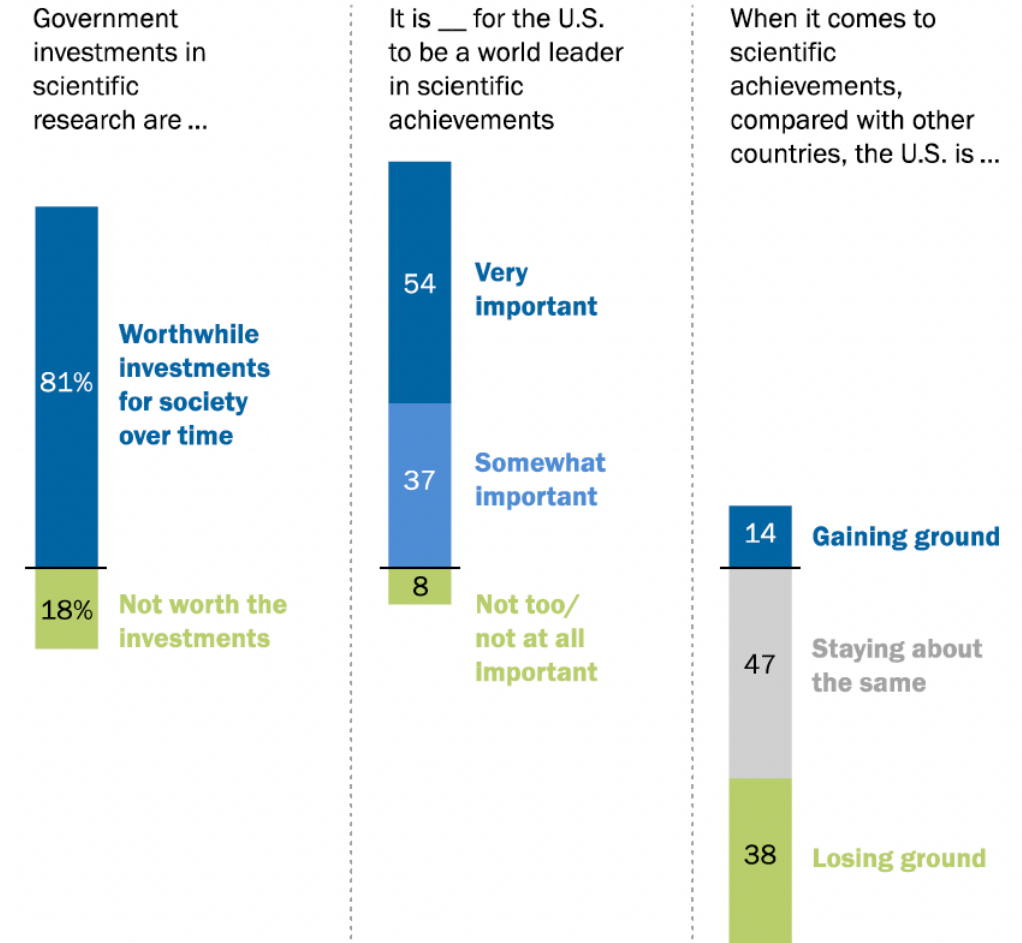
Source: Survey conducted Sept. 13-18, 2022.

"Americans Value U.S. Role as Scientific Leader, but 38% Say Country Is Losing Ground Globally"

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## Most Americans support role for U.S. as global leader in science, but few see its prominence increasing

% of U.S. adults who say ...



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

Source: Survey conducted Sept. 13-18, 2022.

"Americans Value U.S. Role as Scientific Leader, but 38% Say Country Is Losing Ground Globally"

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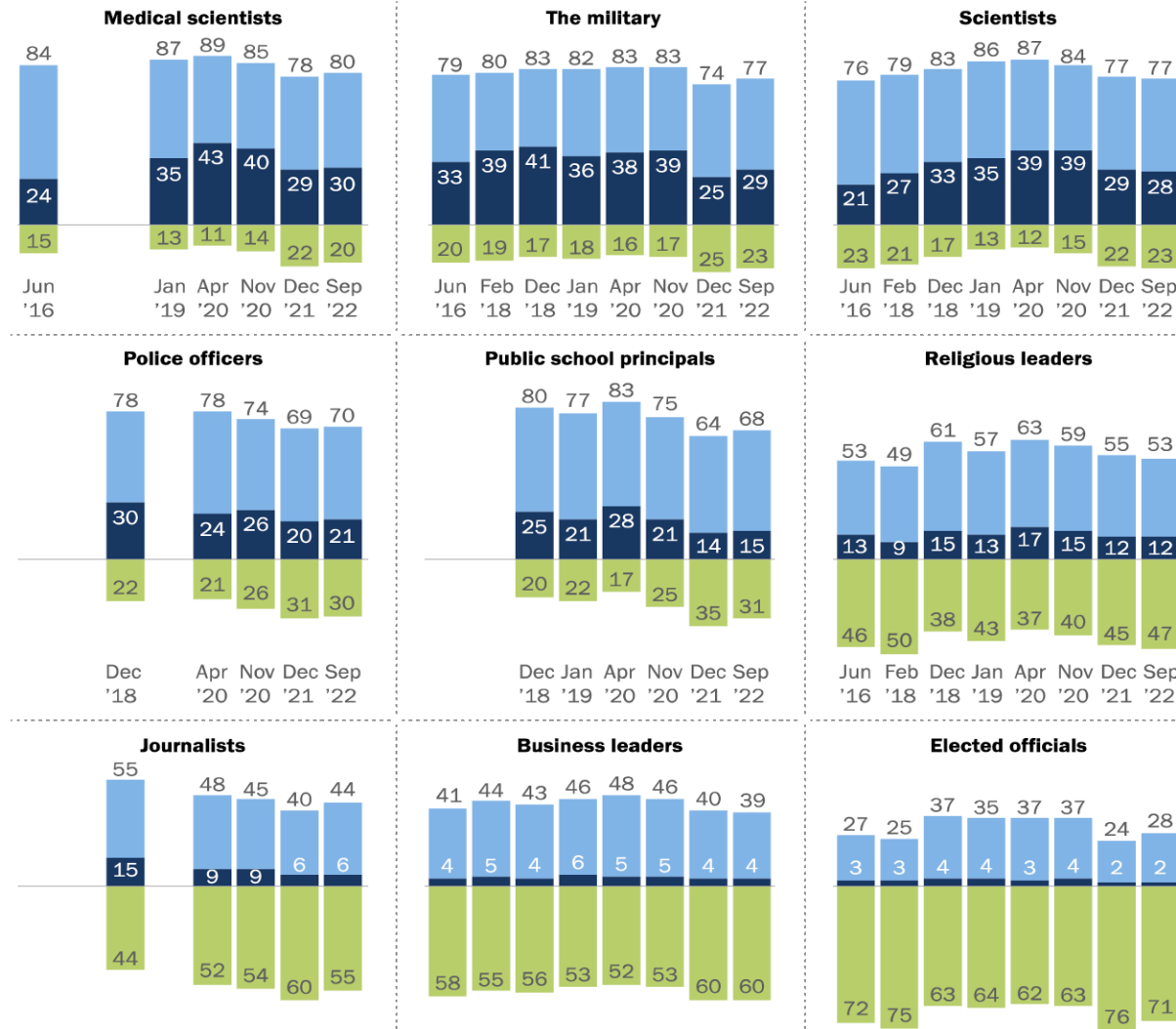


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## Majorities of U.S. adults express at least some confidence in scientists and medical scientists, but ratings remain lower than early in the coronavirus outbreak

% of U.S. adults who have \_\_\_\_ of confidence in the following groups to act in the best interests of the public

● A great deal ● A fair amount ● Not too much/No confidence at all



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

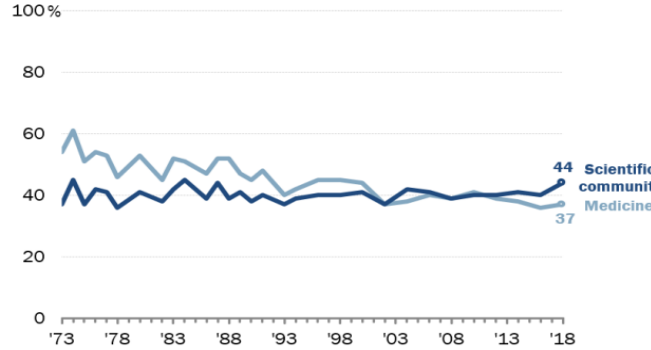
Source: Survey conducted Sept. 13-18, 2022.

"Americans Value U.S. Role as Scientific Leader, but 38% Say Country Is Losing Ground Globally"

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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

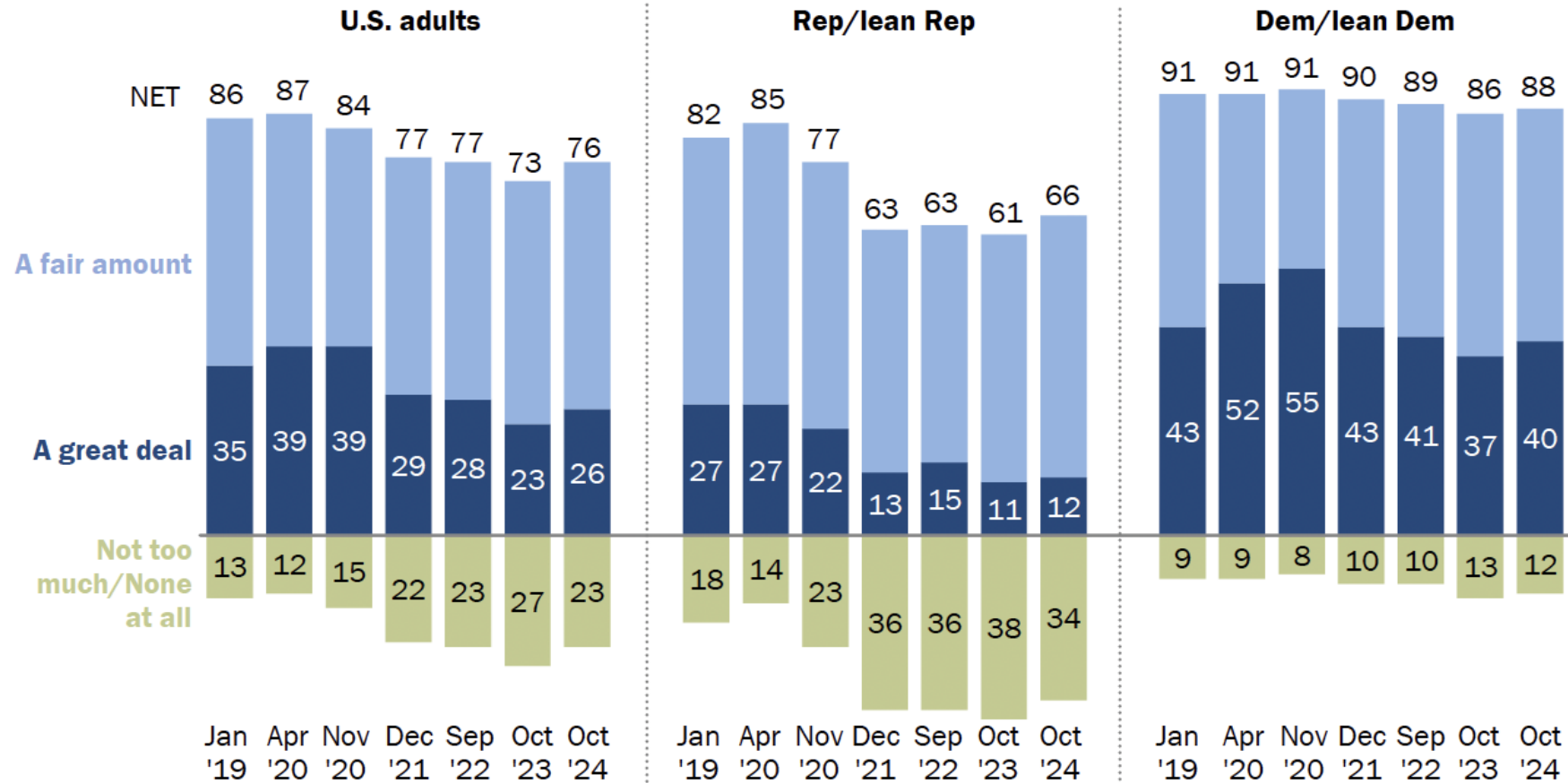


Note: Respondents who gave other responses or who did not give an answer are not shown.  
Source: General Social Surveys, NORC.

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Confidence in scientists remains higher among Democrats than Republicans

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

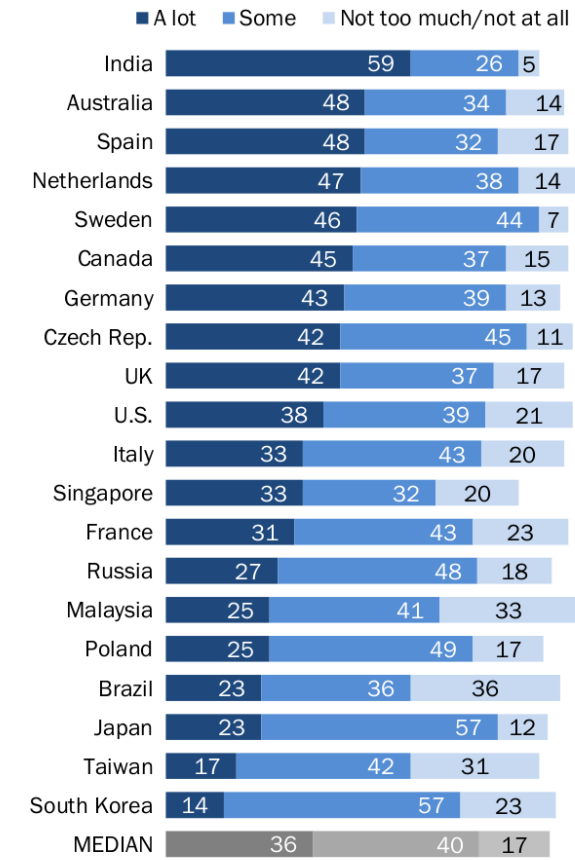


Note: Respondents who did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Oct. 21-27, 2024.  
“Public Trust in Scientists and Views on Their Role in Policymaking”

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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)

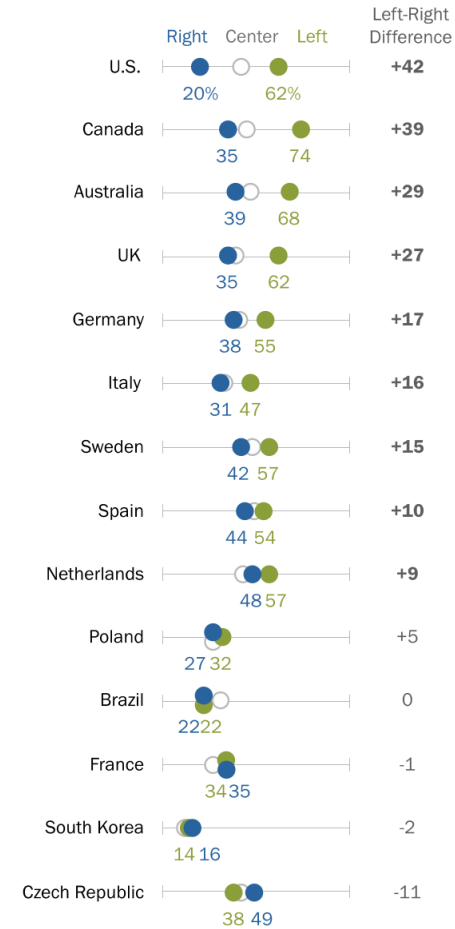


Note: Respondents who did not give an answer are not shown.  
Source: International Science Survey 2019-2020. Q2d.  
"Science and Scientists Held in High Esteem Across Global Publics"

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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)

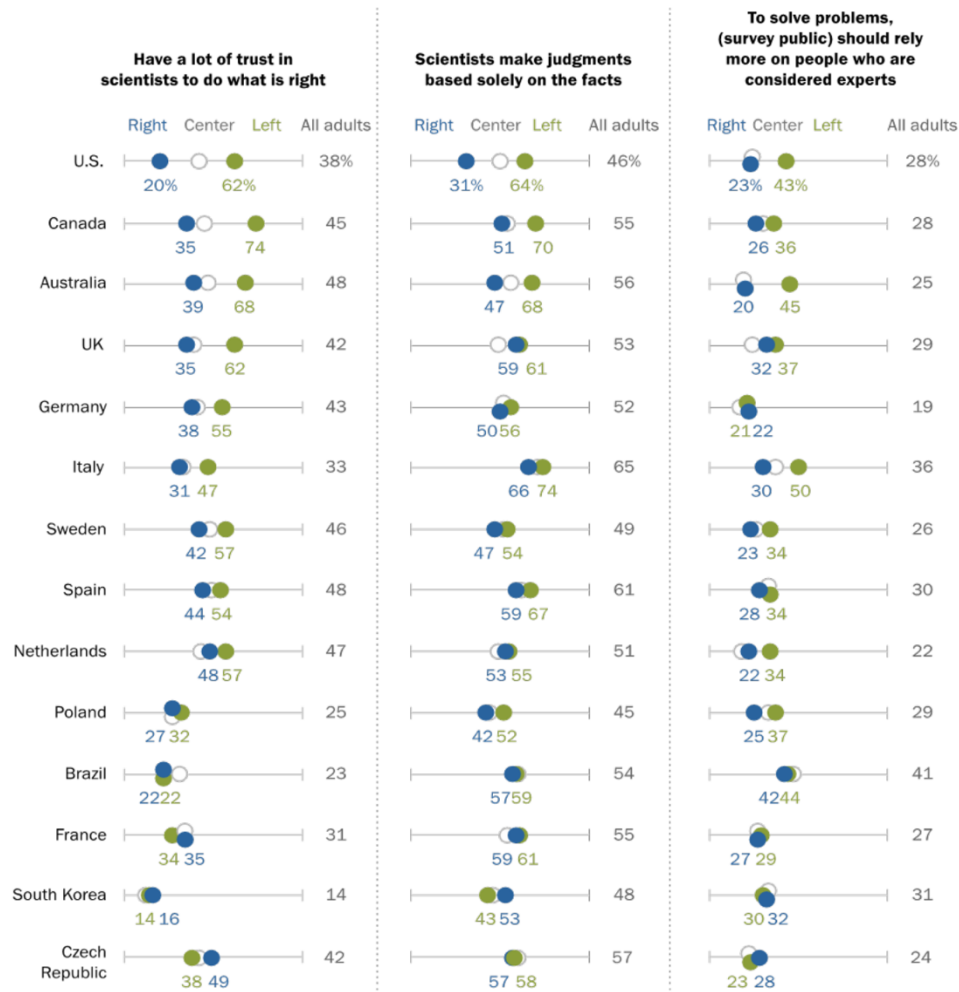


Note: Statistically significant differences in **bold**. Respondents who gave other responses or did not give an answer are not shown.  
Source: International Science Survey 2019-2020. Q2d.  
"Science and Scientists Held in High Esteem Across Global Publics"

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

% who say ...



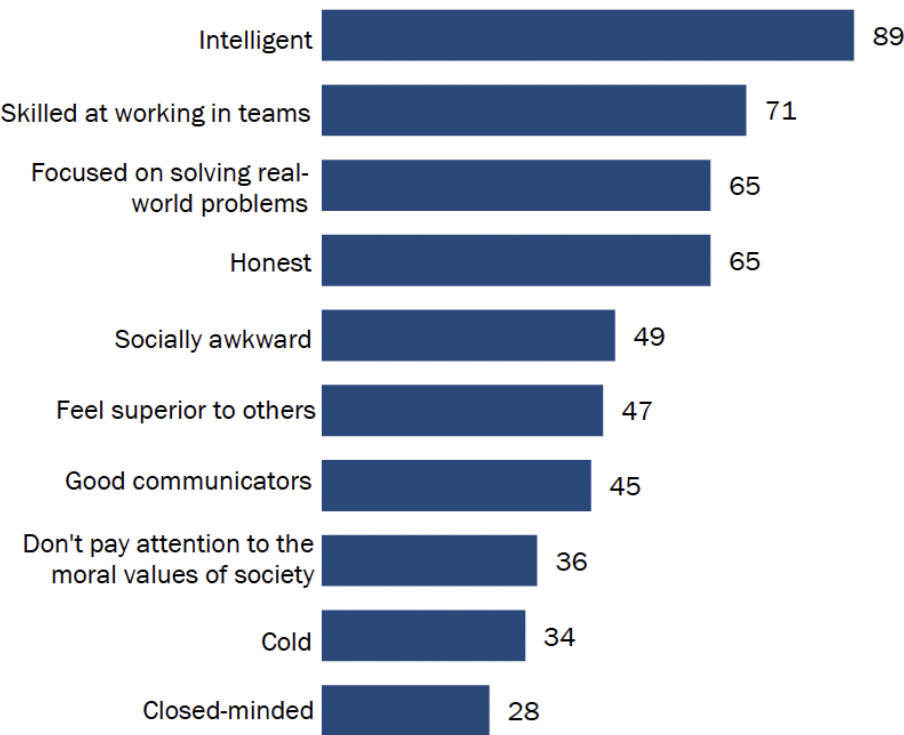
Note: Respondents who gave other responses or did not give an answer are not shown.  
Source: International Science Survey 2019-2020. Q2d, Q15 & Q43.  
"Science and Scientists Held in High Esteem Across Global Publics"

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Scientists widely seen as intelligent; fewer than half view them as good communicators

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

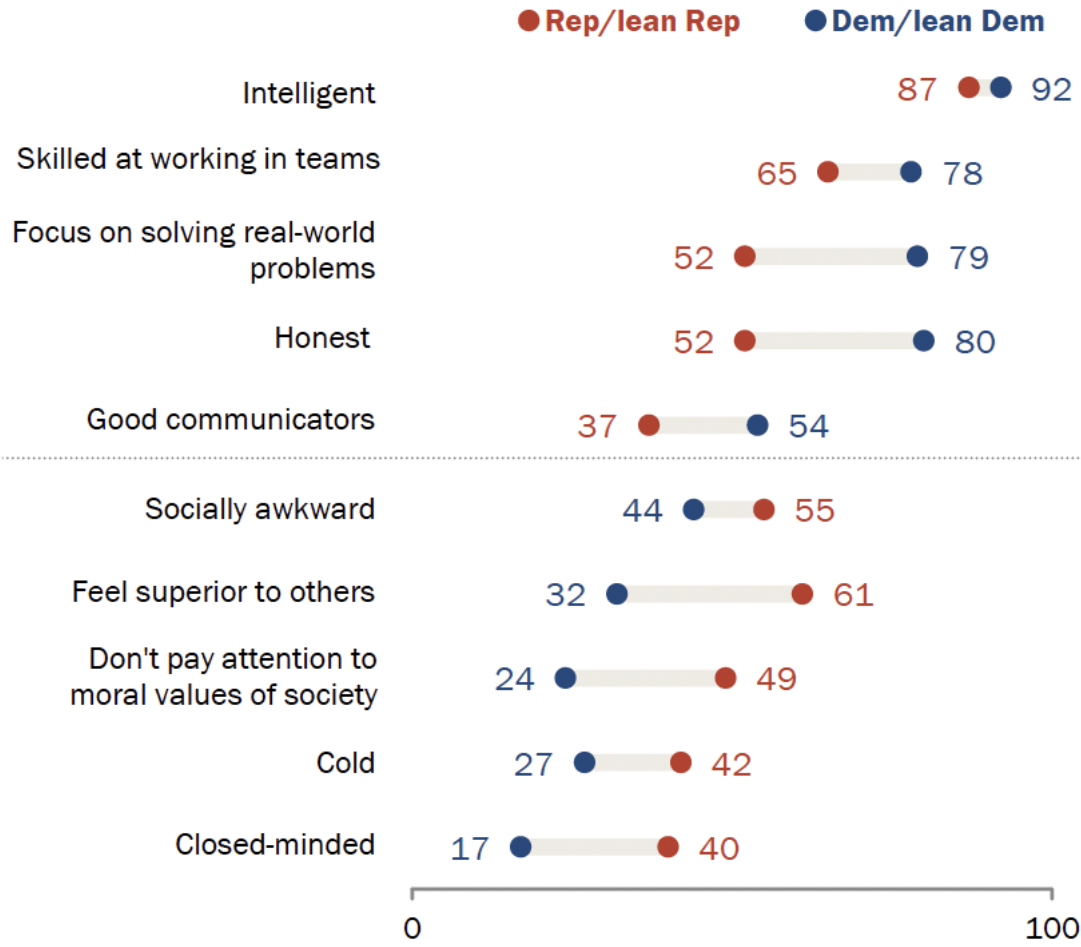


Note: Respondents who gave other responses or did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Oct. 21-27, 2024.  
“Public Trust in Scientists and Views on Their Role in Policymaking”

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Republicans and Democrats differ in views of research scientists’ traits, including honesty

% who say each of the following statements describes most research scientists well

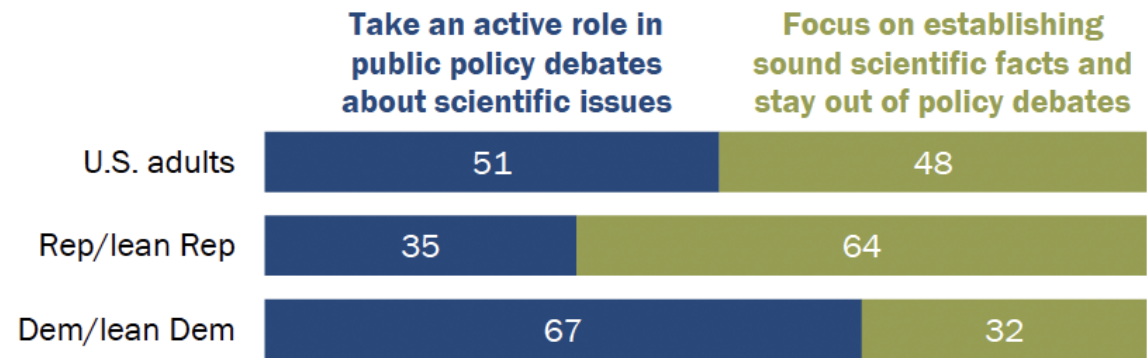


Note: Respondents who gave other responses or did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Oct. 21-27, 2024.  
“Public Trust in Scientists and Views on Their Role in Policymaking”

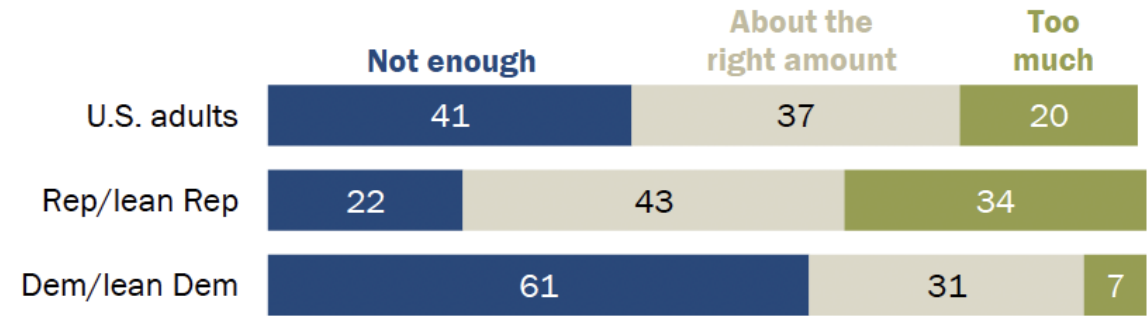
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# Americans are divided over the role for scientists in scientific policy debates

% who say scientists should ...



% who say scientists have \_\_\_ influence in public policy debates

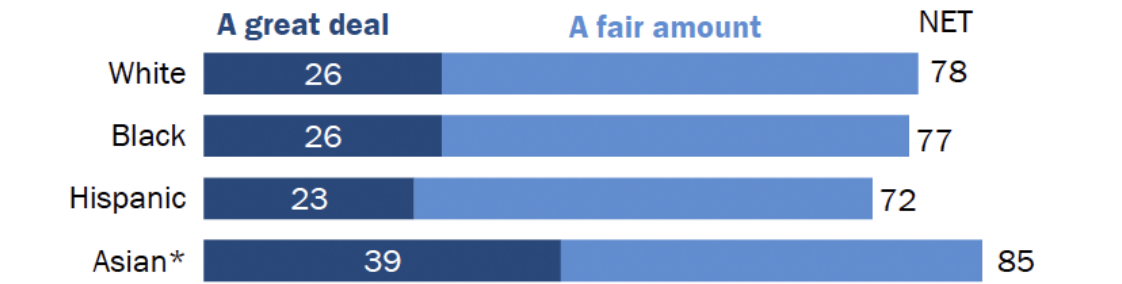


Note: Respondents who did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Oct. 21-27, 2024.  
“Public Trust in Scientists and Views on Their Role in Policymaking”

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# Confidence in scientists to act in public’s best interests, by race and ethnicity

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



Among Dem/lean Dem ...



Among Rep/lean Rep ...

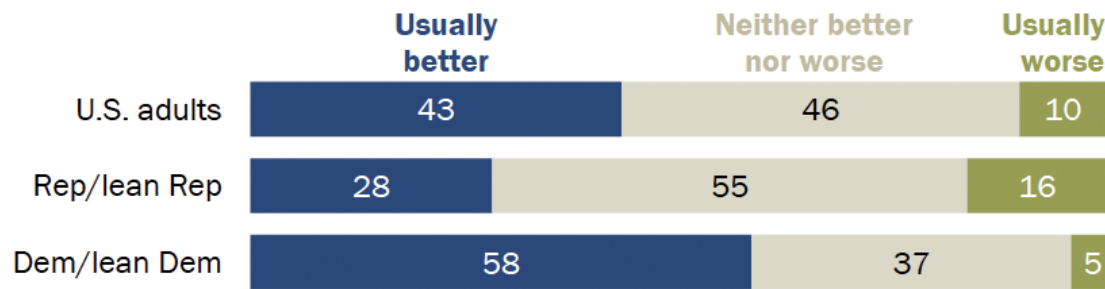


\* Estimates for Asian adults are representative of English speakers only.  
Note: Sample sizes for Black and Asian Republicans are too small to analyze separately. Respondents who gave other responses or did not give an answer are not shown. White, Black and Asian adults include those who report being only one race and are non-Hispanic. Hispanic adults are of any race.  
Source: Survey of U.S. adults conducted Oct. 21-27, 2024.  
“Public Trust in Scientists and Views on Their Role in Policymaking”

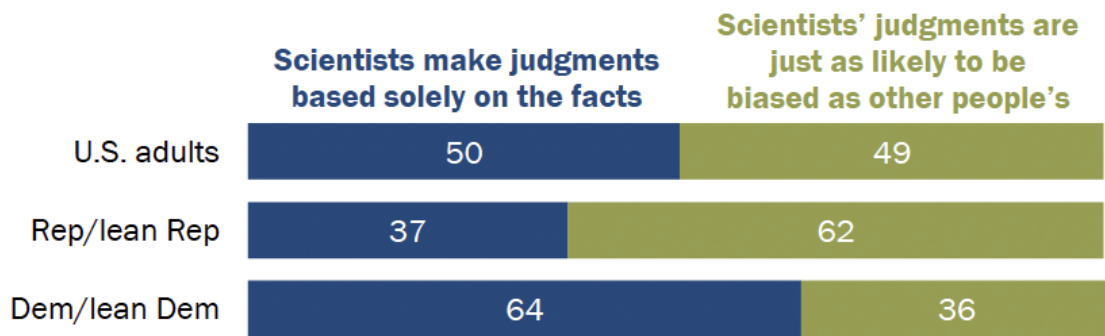
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# Mixed views of scientists' judgment and the quality of their scientific policy decisions

% who say scientists are \_\_\_ at making good policy decisions about scientific issues than other people



% who say ...

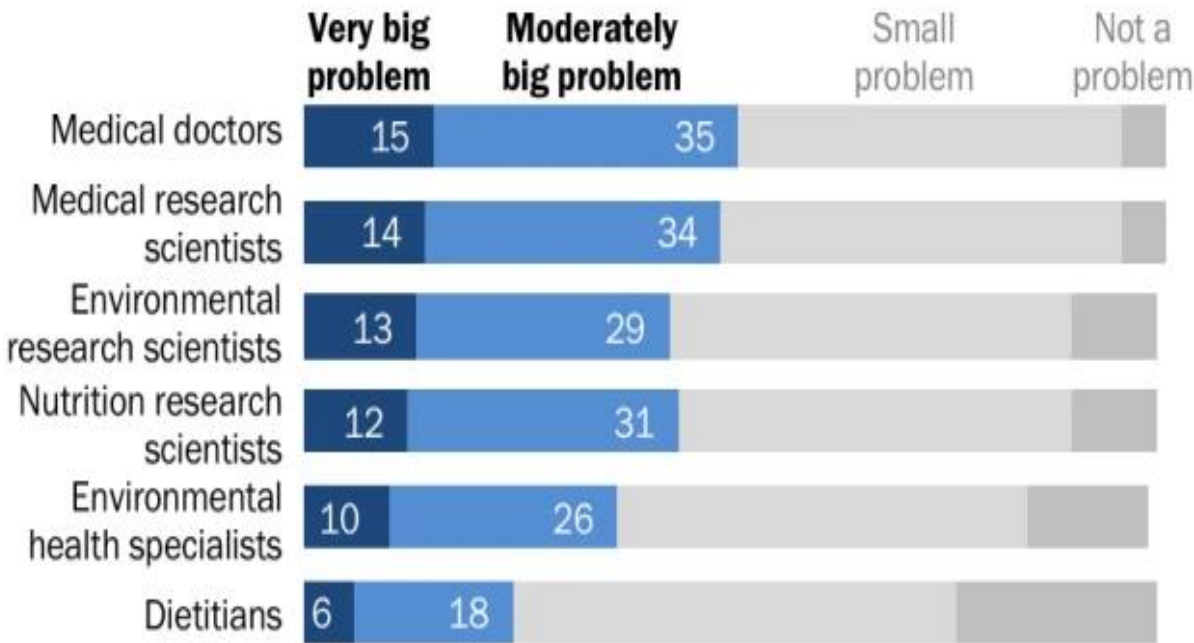


Note: Respondents who did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Oct. 21-27, 2024.  
"Public Trust in Scientists and Views on Their Role in Policymaking"

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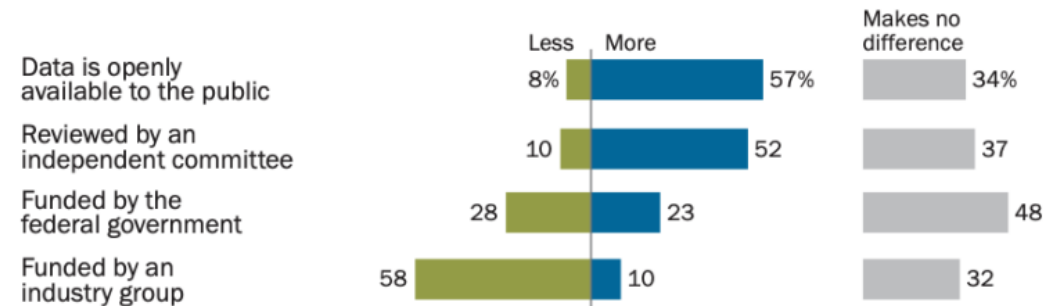
# The public is divided over whether misconduct by medical professionals is a big problem

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

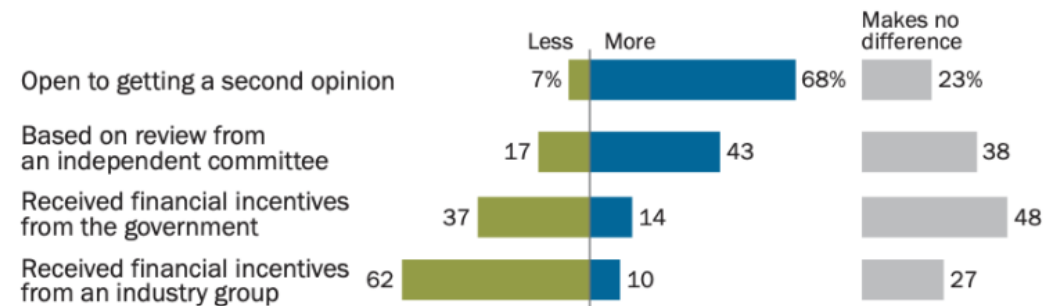


## Majority of Americans say they are more apt to trust research when the data is openly available

*% 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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# Summary:

- Scientists and medical professionals are held in high regard, but that is slipping
- 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).

# 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



# 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



# 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)



# 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



# 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?



# Case Discussions:



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

- Conferences have move 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?



# Responsible Member of Society 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

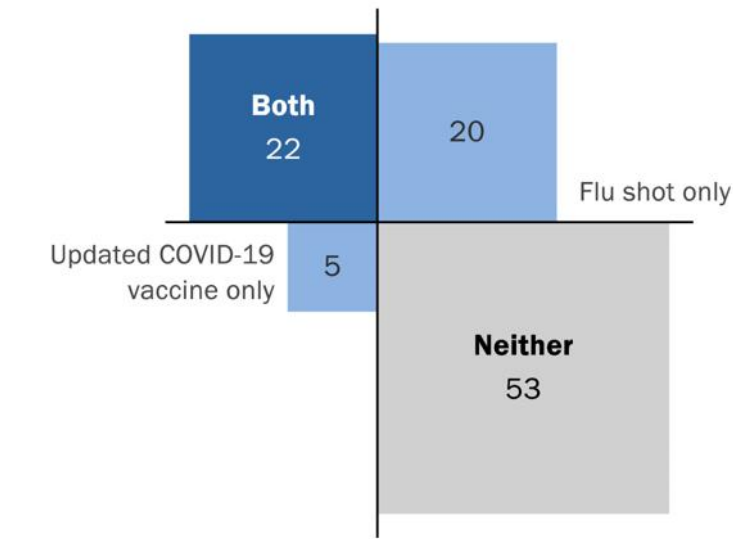
Because all the authors were not granted access to the raw data and the raw data could not be made available to a third-party auditor, we are unable to validate the primary data sources underlying our article, “Cardiovascular Disease, Drug Therapy, and Mortality in Covid-19.”<sup>1</sup> We therefore 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 Vaccines

53% of U.S. adults say they've gotten neither the flu shot nor the updated COVID-19 vaccine since last August

% of U.S. adults who say they have gotten \_\_\_ since August 2024

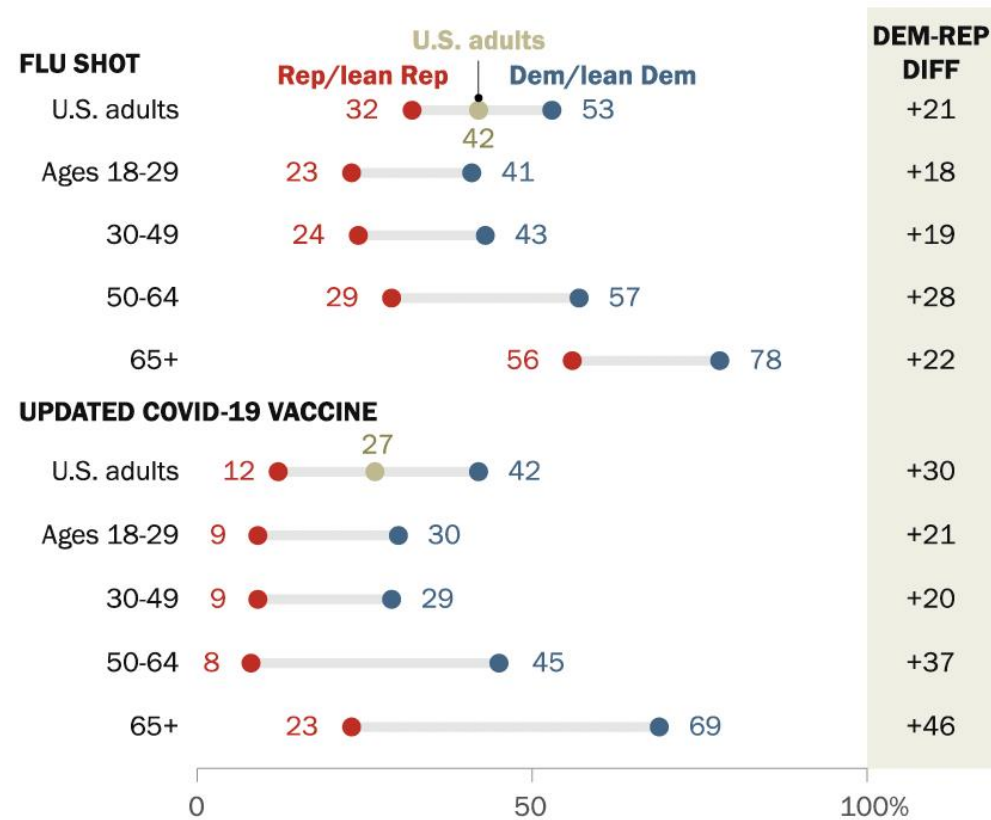


Note: Respondents who did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Feb. 24-March 2, 2025.

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## Across age groups, Democrats and Republicans differ widely in uptake of flu shot, updated COVID-19 vaccine

% of U.S. adults who say they have gotten each of the following since August 2024

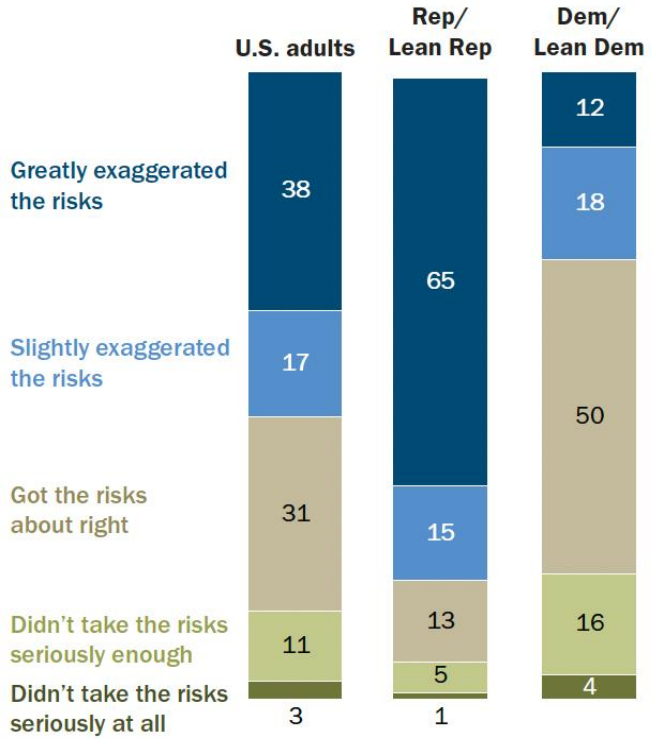


Note: Respondents who gave other responses or did not give an answer are not shown.  
Source: Survey of U.S. adults conducted Feb. 24-March 2, 2025.

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## 8 in 10 Republicans say the news media exaggerated COVID-19 risks

% of U.S. adults who say the news media \_\_\_ when responding to the COVID-19 pandemic



Note: Respondents who did not answer are not shown.  
Source: Survey of U.S. adults conducted Oct. 21-27, 2024.  
"5 Years Later: America Looks Back at the Impact of COVID-19"

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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?



# Responsible Member of Society: Mind the Spin

- The Nature editorial (Nature 461:1174, 2009) Mind the Spin addresses issues related to a press release on a clinical trial
  - The sponsors of the US\$119-million phase III clinical trial, announced that the trial had been a success: an analysis of the data showed that the vaccine had a statistically significant effect on preventing infection.
  - Other scientists could not immediately assess that claim, however: the full data from the trial were not made available until they were presented at an AIDS vaccine conference in Paris and in an article published online the same day (S. Rerks-Ngarm et al. N. Engl. J. Med. doi:10.1056/nejmoa0908492; 2009). The article contained two other data analyses, not mentioned in the initial announcement, showing smaller effects that were not statistically significant (see page 1187)
  - The sponsors also argue that announcing the less-upbeat analyses along with the positive result would have been too complicated for the public to understand
  - Yet the temptation for scientists and their institutions to spin their research to the media, or to go publicity-mongering, is always there. And ----- as illustrated by the excessive public-relations campaign surrounding Ida, a fossil presented as a missing link in human evolution (see Nature 459, 484; 2009 and 461, 1040; 2009) ----- too many in the media will buy into the initial hype. Such behavior is corrosive to the process of scholarly scientific communication. Research institutions must not allow it to become the norm.



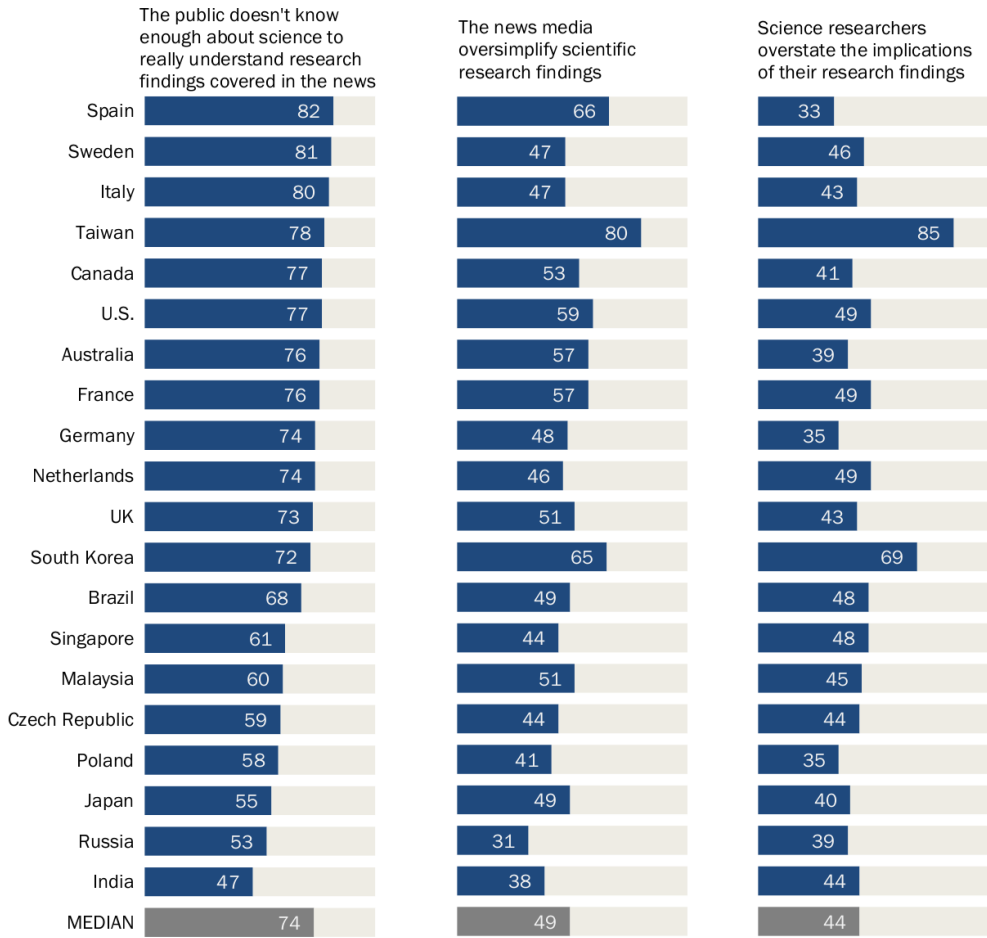
# Group Discussion – 10 min

- What are your responsibilities in conveying research to the non-scientific community accurately and fairly? Are they different if the communication is oral versus written?
- Is there a difference between inaccuracies versus selective reporting and what does this example represent?
- How does the public judge scientific results presented in the press?

Adapted from NIH RCR Cases: Theme 10, Case 2

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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# 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.*



# Resources

If you have questions about RCR, email  
[ClinicalResearchSupportCenter@ucdenver.edu](mailto:ClinicalResearchSupportCenter@ucdenver.edu)

## Documentation:



**Certificates of completion are sent out at the end of the academic year**, for each person who has attended and signed-in for at least 8 of the 9 sessions.



**A Course Evaluation survey will be sent to you after the session**. Complete the 3-minute anonymous survey so we can best understand your experience and improve future courses.



**Slides are available on our website**. Scan the QR code and scroll towards the bottom of the page to the "Course Content" section.

