NIST Special Publication
NIST SP 1287

NIST Scientific Integrity Program

Annual Report

Anne Andrews

NIST

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
U.S. DEPARTMENT OF COMMERCE

NIST Special Publication
NIST SP 1287

NIST Scientific Integrity Program
Annual Report

Anne Andrews
Scientific Integrity Officer
National Institute of Standards and Technology

September 2022

NIST SP 1287
September 2022

Certain commercial entities, equipment, or materials may be identified in this document in order to describe an experimental procedure or concept adequately. Such identification is not intended to imply recommendation or endorsement by the National Institute of Standards and Technology, nor is it intended to imply that the entities, materials, or equipment are necessarily the best available for the purpose.

Abstract

This report summarizes the findings of the NIST Scientific Integrity Program assessment of the program for the period between 1 January 2020 and 31 May 2022. It provides an assessment of the current state of the program in advance of planned updates in 2022. The evaluation was initiated in response to a recommendation from a U.S. Government Accountability Office (GAO) report, Scientific Integrity Policies: Additional Actions Could Strengthen Integrity of Federal Research, April 2019. In addition, the report serves as a baseline evaluation before implementation of substantial updates to the program related to the Presidential Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policy Making, January 27, 2021.

Keywords

Table of Contents

List of Tables

Executive Summary

The NIST Scientific Integrity Program was formally established in policy in 2011. This report provides an assessment of the program for the period between 1 January 2020 and 31 May 2022. It also serves as a baseline assessment prior to initiating planned updates. The program directives are undergoing updates which are expected to be finalized by January 2023. In response to the GAO report, and driven by a commitment to NIST's core value of integrity, a program evaluation was conducted that included focused interviews and an online survey of selected staff. The main findings indicated that while scientific integrity is clearly very important, the directives need to be updated and shared with staff for greater awareness of their rights and responsibilities. Finally, the Scientific Integrity Officer (SIO) will begin an awareness campaign over summer 2022 to help foster communication around scientific integrity at NIST, how it's upheld, what to do when it is not, generate ongoing feedback, and discuss how the program will be changing in the near future.

1. Introduction

1.1. Scientific Integrity at NIST

It is NIST Policy to promote scientific integrity by creating a culture of personal and organizational responsibility where the practice and management of scientific research and of its products are free from undue influences that are not essential to the practice of science such as personal or social allegiances, beliefs, or interests.

NIST's dedication to scientific integrity is highlighted with this assertion on the internal website: NIST is an organization with strong values, reflected both in our history and our current work. NIST leadership and staff will uphold these values to ensure a high-performing environment that is safe and respectful of all.

- **Perseverance:** We take the long view, planning the future with scientific knowledge and imagination to ensure continued impact and relevance for our stakeholders.

- **Integrity:** We are ethical, honest, independent, and provide an objective perspective.

- **Inclusivity:** We work collaboratively to harness the diversity of people and ideas, both inside and outside of NIST, to attain the best solutions to multidisciplinary challenges.

- **Excellence:** We apply rigor and critical thinking to achieve world-class results and continuous improvement in everything we do.

1.2. Research Protections Office

The Research Protections Office (RPO) is dedicated to supporting NIST researchers and ensuring their research is conducted with integrity. With this goal in mind, the RPO coordinates

and implements several research compliance programs at NIST including the Human Subjects Protections Program, the Humane Care and Treatment of Vertebrate Animals Program, the Export Control and Compliance Program, and the Scientific Integrity Program.

The RPO supports the Scientific Integrity Program with two staff members. The RPO Director serves as the NIST SIO. The Research Protections Analyst assists with Scientific Integrity Program management.

1.3. Scientific Integrity Program Directives

NIST's Scientific Integrity Program directives were developed initially in 2011 in response to several actions by the Executive branch. These actions included the 2009 Presidential Memorandum [1] and the 2010 OSTP Memorandum.[2] The 2021 Presidential Memorandum [3] and the 2022 National Science and Technology Council Report of the Scientific Integrity Fast Track Action Committee, *Protecting the Integrity of Government Science* (SI-FTAC Report) [4] prompted assessment of agency policies and identified effective practices for agency scientific integrity policies. The updates related to these last two actions are discussed later in this report.

NIST handles allegations related to violations of scientific integrity and research misconduct under separate policies. In addition, NIST developed guidance specific to authorship separate from research misconduct, unless concerns extend to the broader context of one or more of the other policies. Table 1 contains the list of current Scientific Integrity Program policies.

Table 1. Current Scientific Integrity Program Directives

Number	Title	Updated
P[a] 5100.00	Scientific Integrity Policy	2011
O[b] 5100.00	Scientific Integrity	2019
PR[c] 5101.01	Reporting and Resolving Allegations Regarding Violations of Scientific Integrity	2014
P 5200.00	Responsible Conduct of Research	2014
O 5201.00	Responsible Conduct of Research Order	2019
PR 5201.01	Procedures in Response to Allegations of Research Misconduct	2014
G[d] 5201.01	Guidance for Authorship of Scholarly and Technical Publications	2018

[a]P=Policy; [b]O=Order; [c]PR=Procedure; [d]G=Guidance

2. Scientific Integrity Program Initiatives

2.1. Committee Participation

The NIST SIO actively participated in a number of committees that will help strengthen scientific integrity across the Federal government, the Department of Commerce, and NIST:

2.1.1. NSTC SI-FTAC

The NIST SIO co-chaired the Scientific Integrity Definition Working Group, a working group of the SI-FTAC. This working group was established to provide a necessary element of the framework for assessing department policies. An overarching definition of scientific integrity was identified as essential for use across Federal agencies.

2.1.2. Department of Commerce Bureau Working Group

This group is developing the Department's scientific integrity policy in response to the 2021 Presidential Memorandum that will apply to the entire Department, while also supporting the established polices at NIST and the National Oceanic and Atmospheric Administration (NOAA).

2.1.3. Interagency Scientific Integrity Working Group

The NIST SIO and Chief Counsel are members of this group.

2.2. Program Updates

2.2.1. Directives

The NIST directives have been reviewed for revision to reflect requirements from the 2021 Presidential Memorandum and the findings of the program evaluation discussed below. Significant changes to the policies include updates to the training plan and development of an evaluation and reporting plan. The draft updates are expected to be finalized by January 2023.

2.2.2. Program Evaluation

The baseline evaluation of the program was conducted in May 2022 and included focused interviews with key leaders across NIST and a survey of NIST staff. The purpose of the baseline evaluation was to get a sense of the current staff awareness before implementation of planned updates. In addition, it served to identify areas where the program needs to focus or improve.

2.2.2.1. Focused Interviews

Twelve key leaders were interviewed. The focused interviews resulted in a few common themes. They are organized by main question here.

- What is your understanding or awareness of scientific integrity? What does it mean to you?
    - The common theme was that the science must come first with no shortcuts. The work should not be overly affected by outside influences. Integrity is a NIST core value.

- What elements do you think our policy should include? Or, what would make a good scientific integrity program?

  o The common theme was that the policy should be clear and thorough. There should be a clear set of standard behaviors and expectations. There should be a clear process for handling different scientific approaches or opinions. So many disagreements revolve around authorship, and a clear authorship policy would be very helpful. There should be accountability and defined consequences.

- How would you prefer to receive training about scientific integrity?

  o There was consistent agreement that training is most effective in person, but there should be options for other venues such as online training. A second very common theme was that the training should be interactive and include storytelling. NIST has several very good stories that are highly relevant and would serve as excellent case studies.

- Have you had any concerns about scientific integrity at NIST? Do you know how or whether they were addressed?

  o The common theme was that our directives need to be updated and that staff need to know where to go with concerns. The current program is nearly invisible.

- Do you have any other thoughts or comments that you would like to share?

  o A few people indicated that it is important that staff have the option to submit allegations anonymously. It is important that staff know their rights and that they have protections.

2.2.2.2. Survey

The survey was open to all staff and used a snowball sampling strategy. An invitation was sent to approximately 100 staff members with requests for them to forward to coworkers. A survey link was also included in the SIO's email signature block. The survey was open until 31 May 2022. There were 31 respondents. The aggregated data for each response are presented in the appendix. Given the low response rate, the data were not analyzed further. The SIO will work with NIST leadership on efforts to improve sampling and response rates for future surveys.

2.2.3. Responding to Scientific Integrity Concerns

Between 1 January 2020 and 31 May 2022, there were three allegations forwarded to the SIO. Table 2 summarizes the type of allegation and disposition of the case. Ongoing cases will be added to future annual reports after the case is closed.

Table 2. Summary of Allegations

Type of Allegation	Status of Reporter	Allegation	Disposition
SI[a]	External	Unauthorized use of patient data in clinical research	Dismissed. Mass email to Federal agencies. NIST not involved in this type of research
SI/RM[b] (F)[c]	External	Unauthorized enrollment of persons in clinical research; falsification of research records related to research funding	Dismissed. Relevant respondents had never been involved or asked to be involved with NIST research; NIST researcher had not received funding from agency indicated in complaint
RM (P)[d]	External	NIST authors copied work	Dismissed. Concept in question was not copied from another researcher; the paper used appropriate citations

[a]SI=Scientific Integrity; [b]RM=Research Misconduct; [c]F=Falsification; [d]P=Plagiarism

3.   Future Directions

The program evaluation highlighted several areas where the program could be improved. The baseline assessment seems to validate our assumption that while staff believe scientific integrity is important at NIST, they are not familiar with our established program. As a result, the SIO intends to begin an awareness campaign over the summer of 2022. This awareness campaign would help foster communication around scientific integrity at NIST, how it is upheld, what to do when it is not, continue to get feedback, and discuss how the program will be changing in the near future.

In addition to the awareness campaign, the SIO will be developing an updated training program for new and current staff. The SIO will also develop an evaluation plan to ensure continuous assessment of the program. The evaluation plan will include an annual report to follow this baseline report that will be shared with NIST leadership, staff, and the public. Both plans will be developed, and implementation begun by the end of the calendar year.

4.   Conclusions

NIST's dedication to integrity is strong. While it is clear that NIST staff are dedicated to upholding scientific integrity, it is also clear that our policies need to be updated and socialized within the agency. The SIO will continue the planned updates and begin an awareness campaign to engage staff in the program.

References

[1]   The White House (2009) *Presidential Memorandum for the Heads of Executive Departments and Agencies on Scientific Integrity*. Available at: https://obamawhitehouse.archives.gov/the-press-office/memorandum-heads-executive-departments-and-agencies-3-9-09

[2]   Office of Science and Technology Policy (2010) *Presidential Memorandum for the Heads of Executive Departments and Agencies on Scientific Integrity*. Available at:

https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/scientific-integrity-memo-12172010.pdf

[3] The White House (2021) *Presidential Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policy Making*. Available at: https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/memorandum-on-restoring-trust-in-government-through-scientific-integrity-and-evidence-based-policymaking/

[4] National Science and Technology Council (2022) *Protecting the Integrity of Government Science*. Available at: https://www.whitehouse.gov/wp-content/uploads/2022/01/01-22-Protecting_the_Integrity_of_Government_Science.pdf

Appendix A.   Survey Results

There were 33 respondents to the survey. Not all respondents answered every question and some questions allowed for multiple answers.

Demographic Questions

- Employment Status
  - Federal employee: 31
  - NIST Associate: 0
  - Contractor: 0

- Career Path
  - ZP: 25
  - ZS: 0
  - ZT: 0
  - ZA: 1
  - ST/SES/SEL: 4

- Pay Band
  - I: 0
  - II: 0
  - III: 2
  - IV: 8
  - V: 16
  - SES: 1
  - ST: 1

- Years at NIST
  - <1 year: 0
  - 1-5 years: 4
  - 6-10 years: 5
  - 11-15 years: 3
  - 16-20 years: 4
  - >20 years: 14

- Highest Level of Education
  - High school: 0
  - Bachelor's: 1
  - Master's: 8
  - JD: 0
  - PhD: 22

- Supervisor
  - Yes: 17
  - No: 14

- Role(s) at NIST
  - Conduct science: 21
  - Utilize science: 7
  - Communicate science: 16
  - Manage science or scientists: 16
  - Other: 0

Knowledge of Scientific Integrity
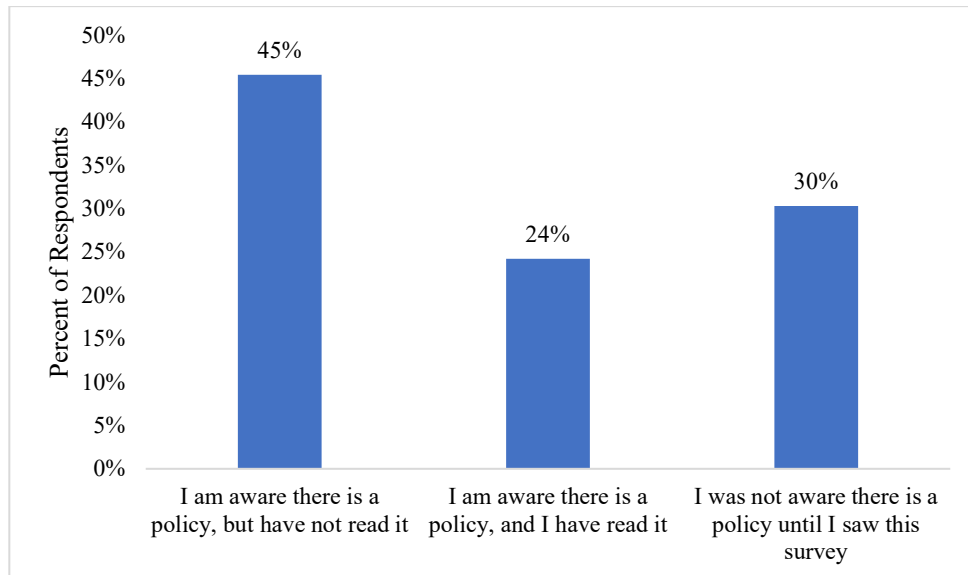
Question 1. How familiar are you with NIST's Scientific Integrity Policy?
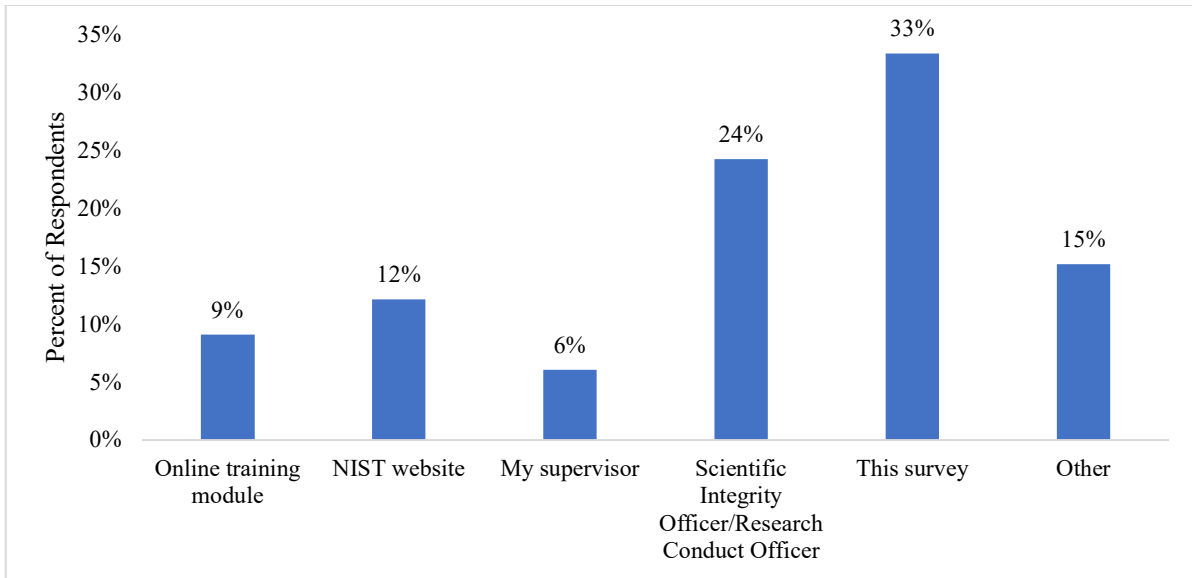
Question 2. How did you learn about the Scientific Integrity Policy?
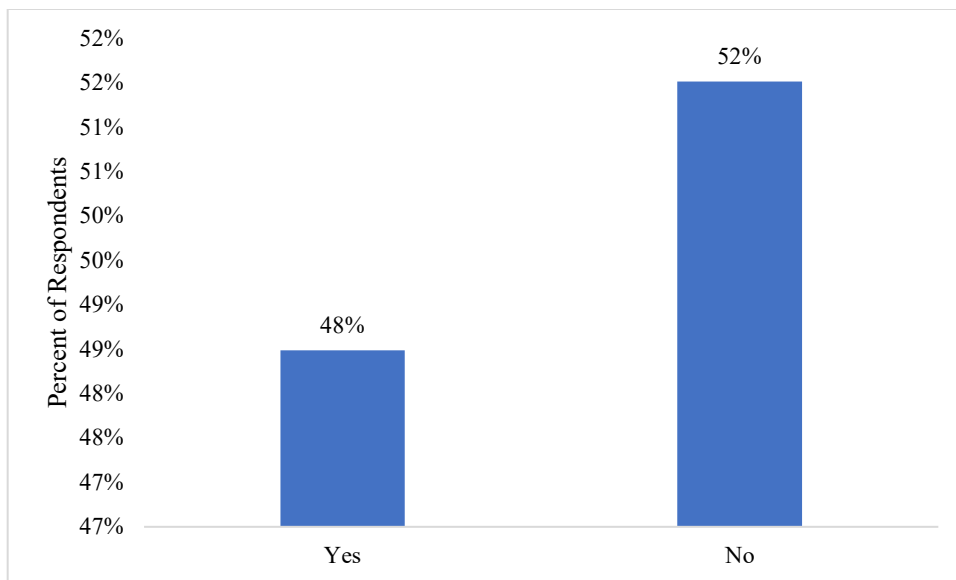
Question 3. Do you know how to report instances or allegations about scientific integrity?
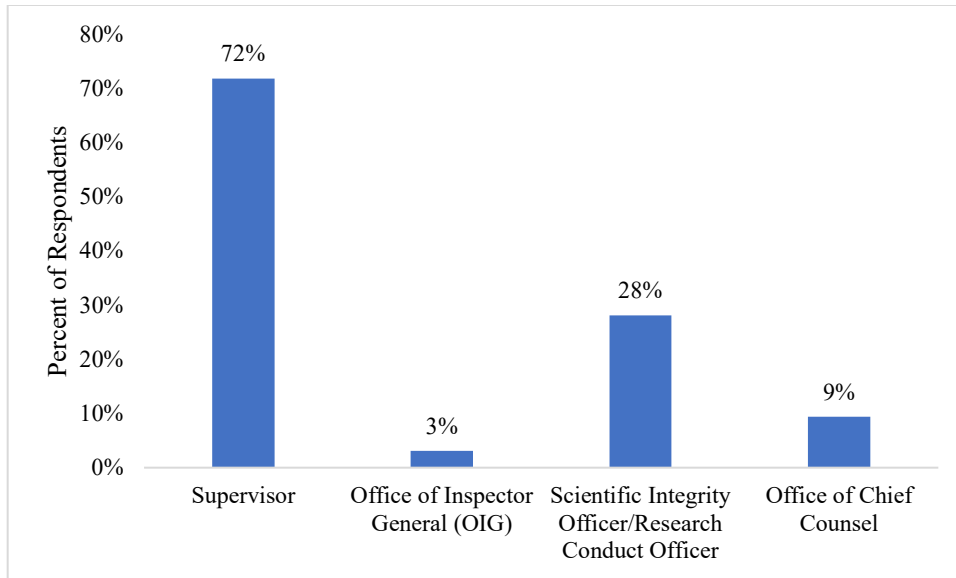
Question 4. To whom would you feel comfortable reporting instances or allegations about scientific integrity?

No respondents marked Union.

Knowledge of Research Conduct Policy
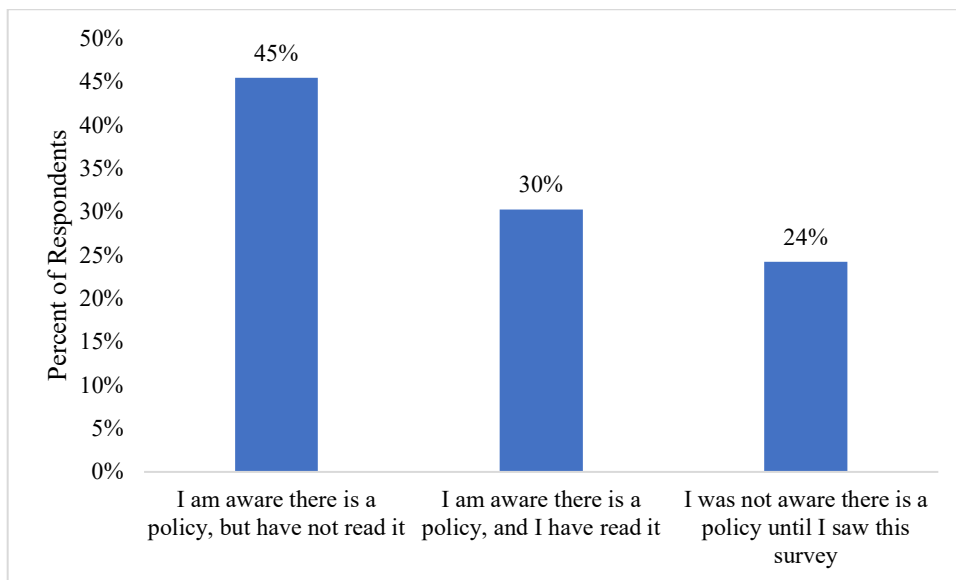
Question 5. How familiar are you with NIST's Research Conduct Policy?
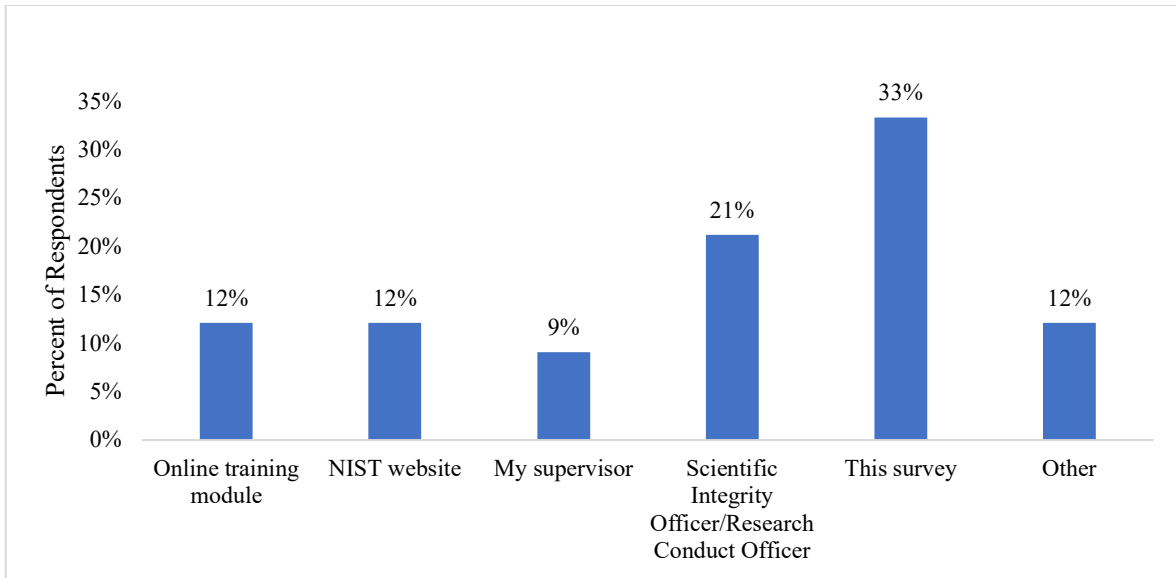
Question 6. How did you learn about the Research Conduct Policy?
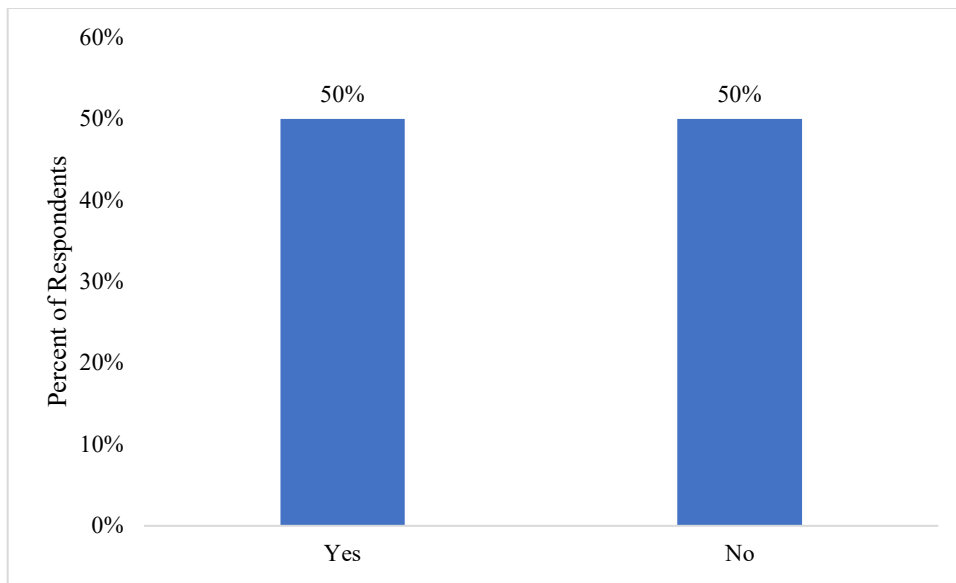
Question 7. Do you know how to report instances or allegations of research misconduct?
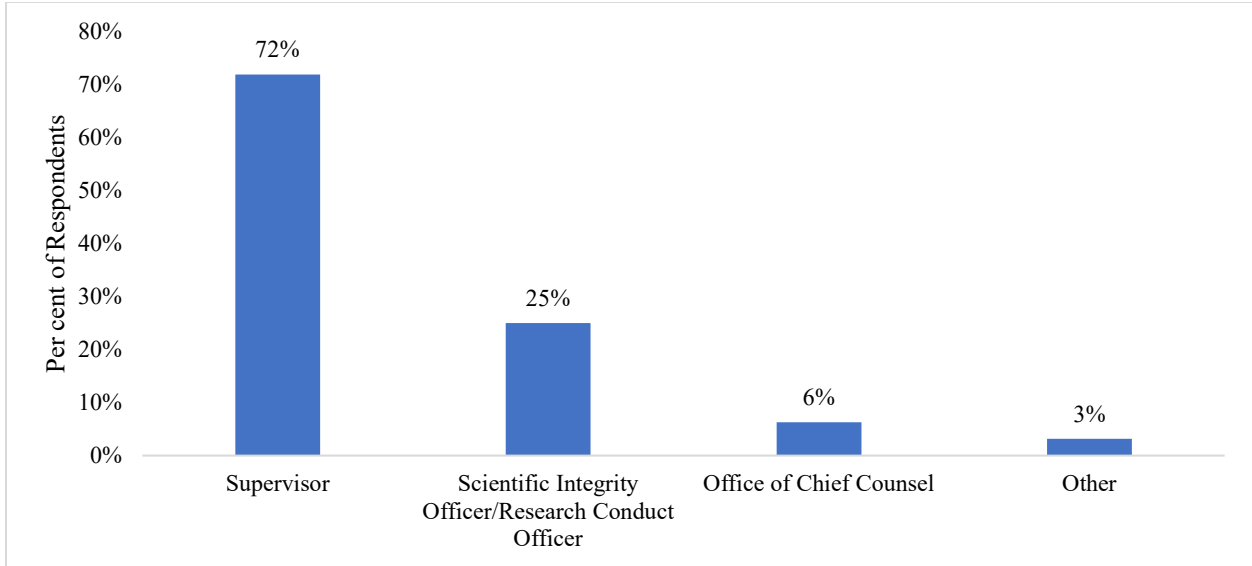
Question 8. To whom would you feel comfortable reporting instances or allegations of research misconduct?

No respondents marked Union or Office of Inspector General (OIG)

Beliefs About Culture of Scientific Integrity and Ethical Conduct of Research
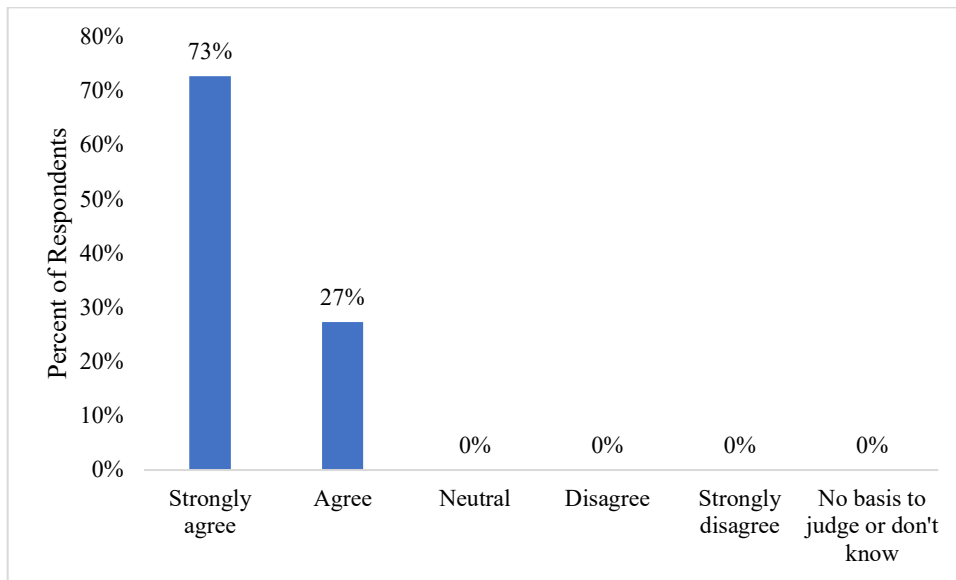
Question 9. The work of NIST is informed by robust science
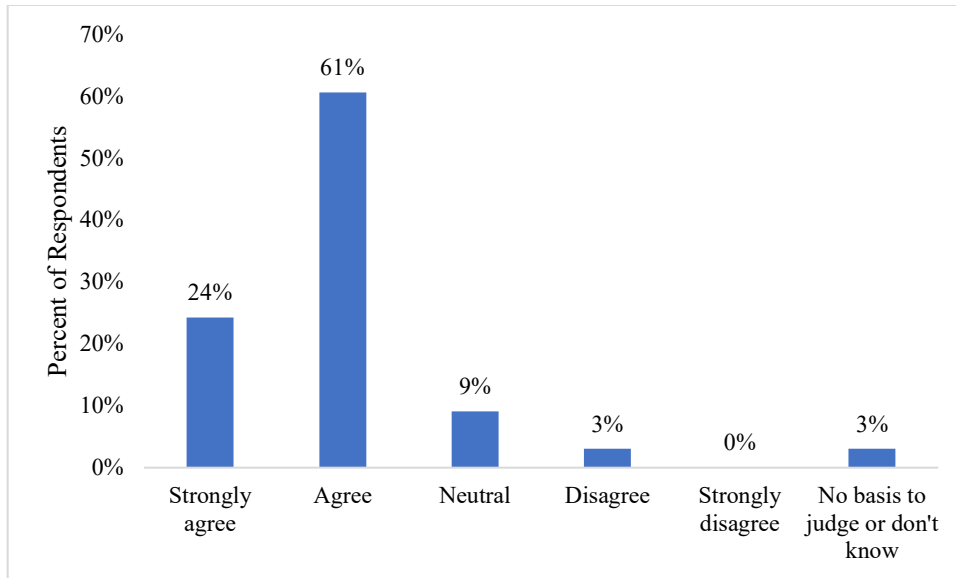
Question 10. Scientific findings are generated, reviewed, and shared in a timely manner
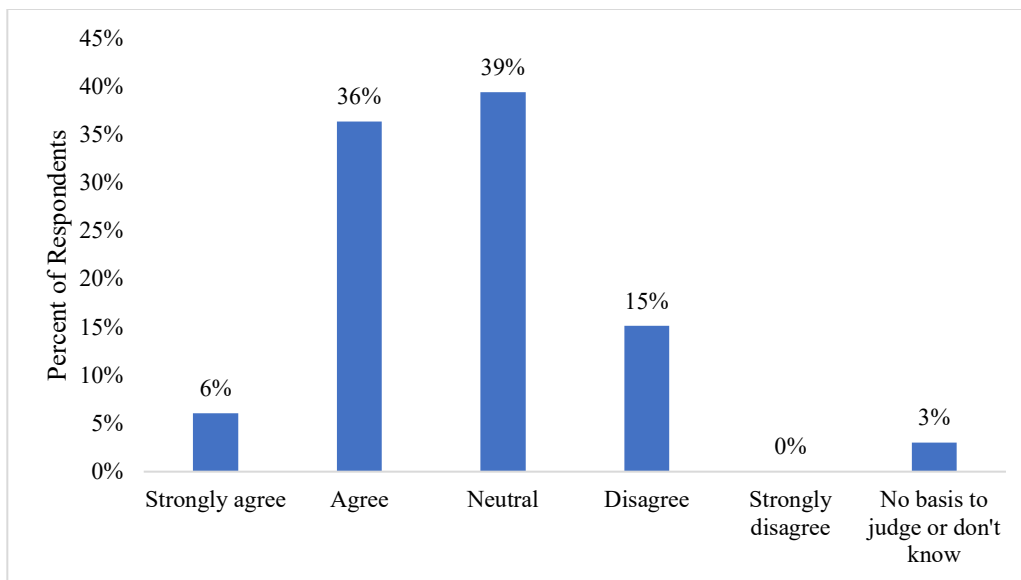
Question 11. The public appreciates and understands NIST's work
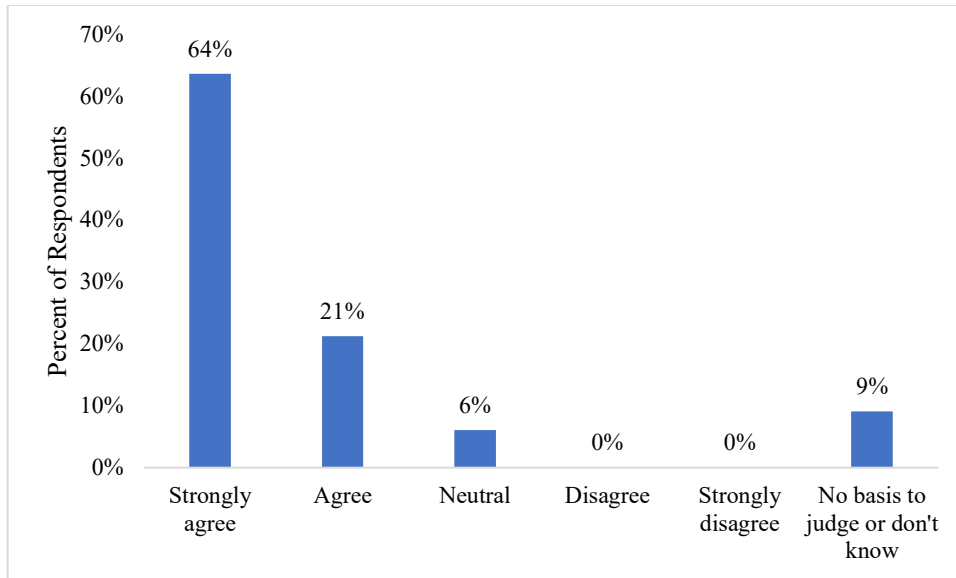
Question 12. Scientists are able to do their best work knowing they are protected from intimidation or coercion to alter scientific data or findings

Beliefs About Culture of Scientific Integrity at NIST
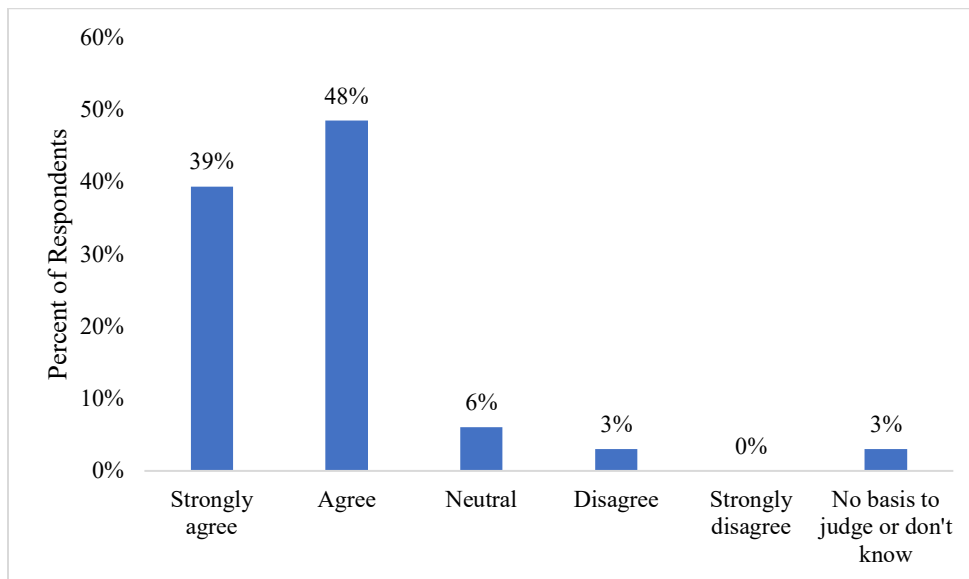
Question 13. In my official capacity at NIST, I can openly express my scientific opinions about NIST's scientific work without fear of retaliation
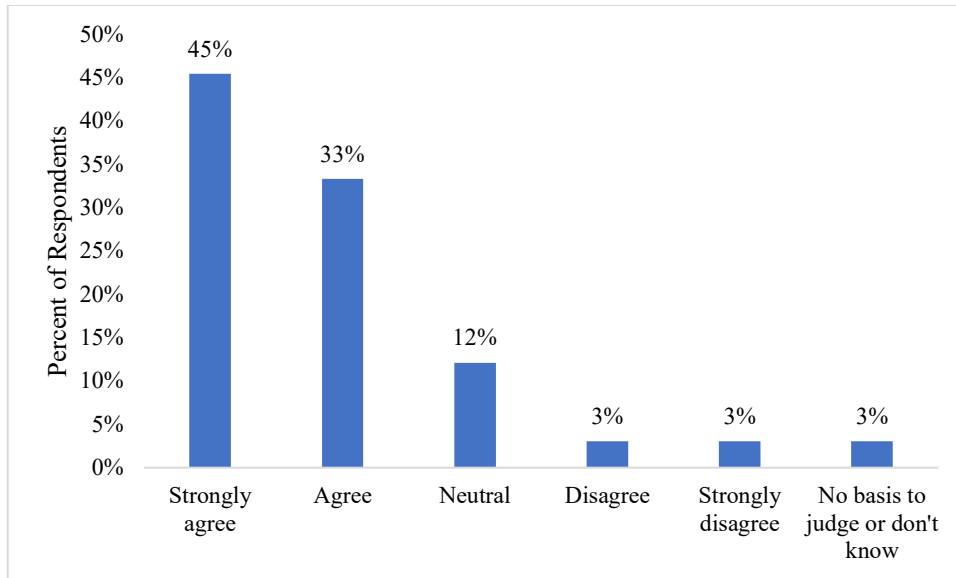
Question 14. In my personal capacity, I can freely express my scientific views provided I specify that I am not speaking on behalf of, or as a representative of, the agency
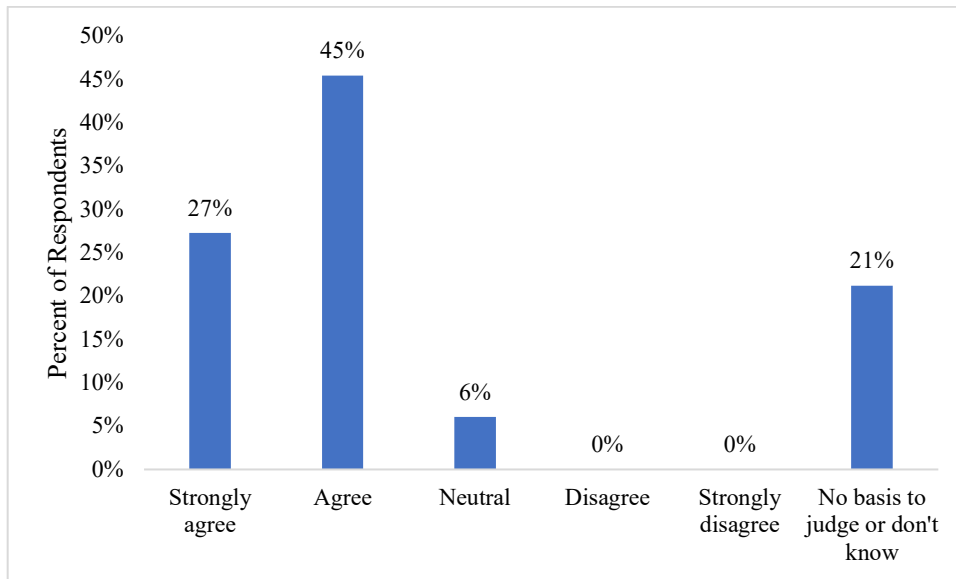
Question 15. My management chain consistently stands behind scientific staff who put forth scientifically defensible positions that may be controversial
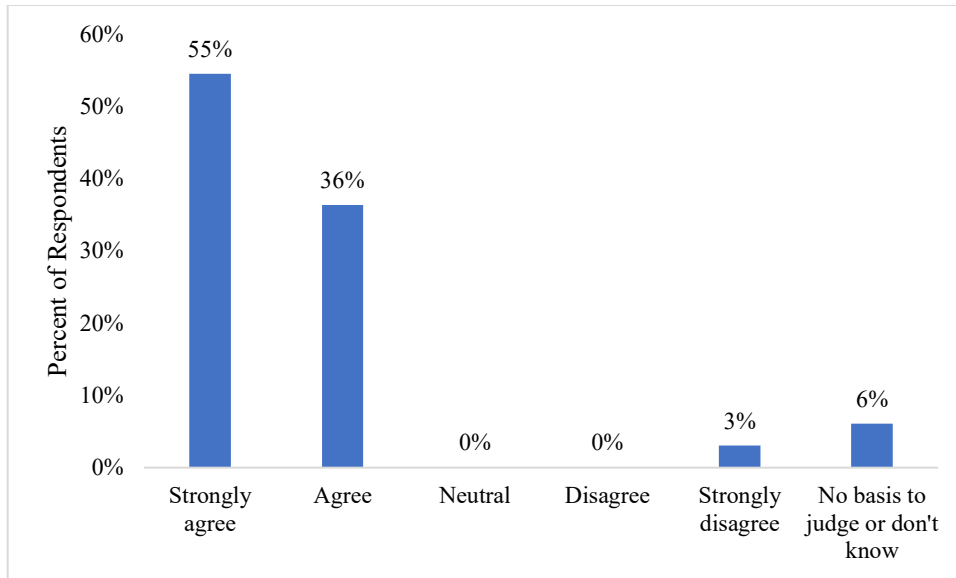
Question 16. I have the right to review, correct and approve the scientific content of a NIST document, before public dissemination, that significantly relies on my scientific research, identifies me as an author, or represents my scientific opinion
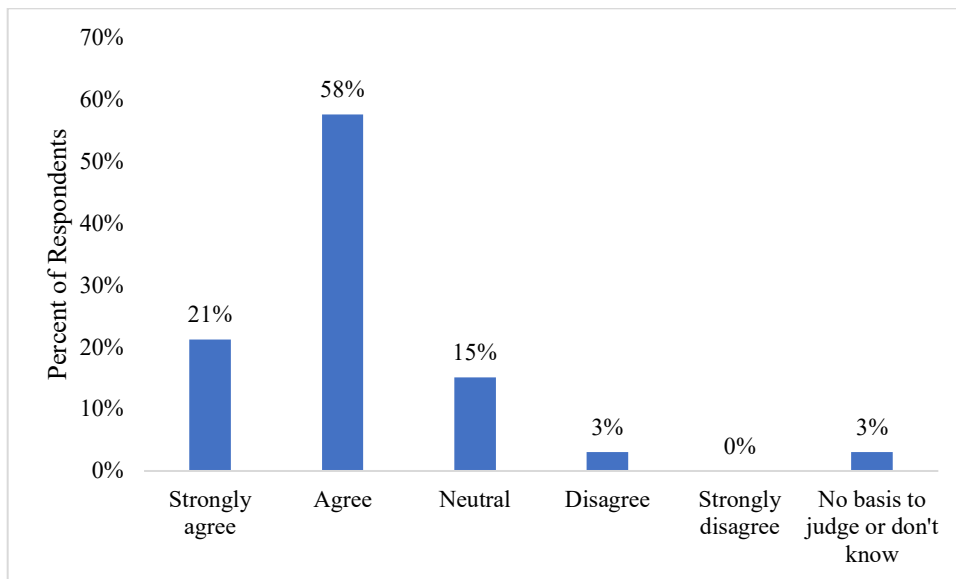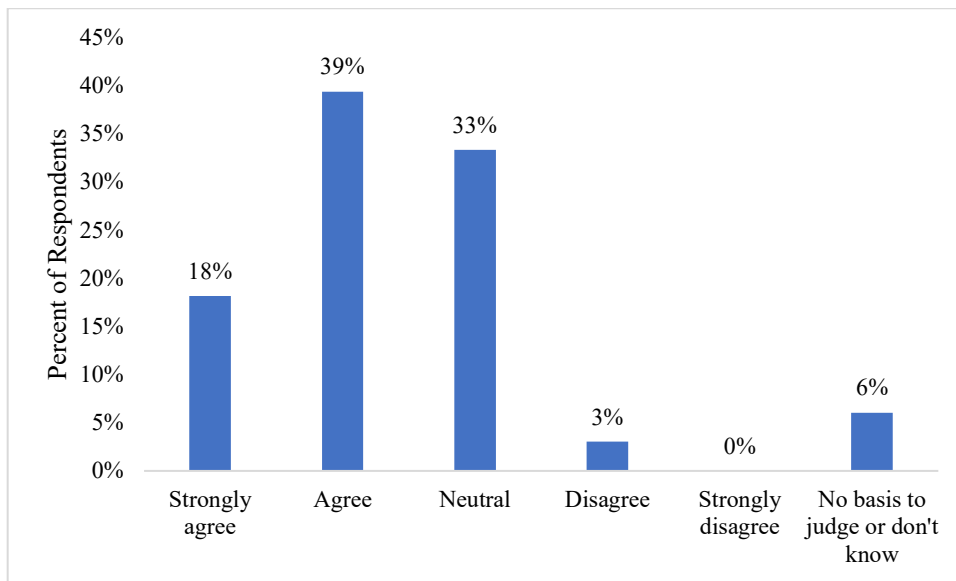

Question 17. The scientific or technical products to which I contribute are released to the public in a timely fashion
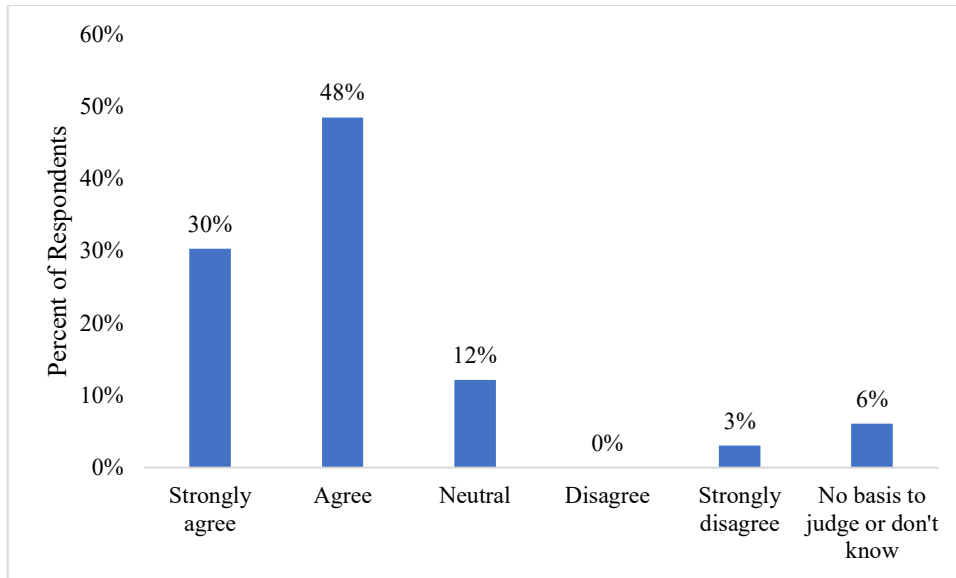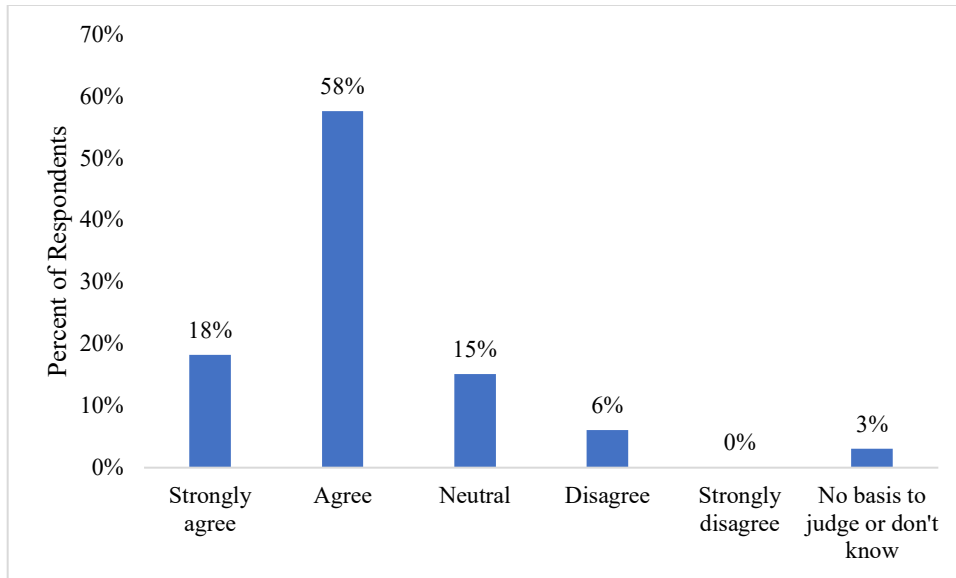
Question 18. NIST policies regarding speaking to the news media support accurate representation of my scientific research to the general public
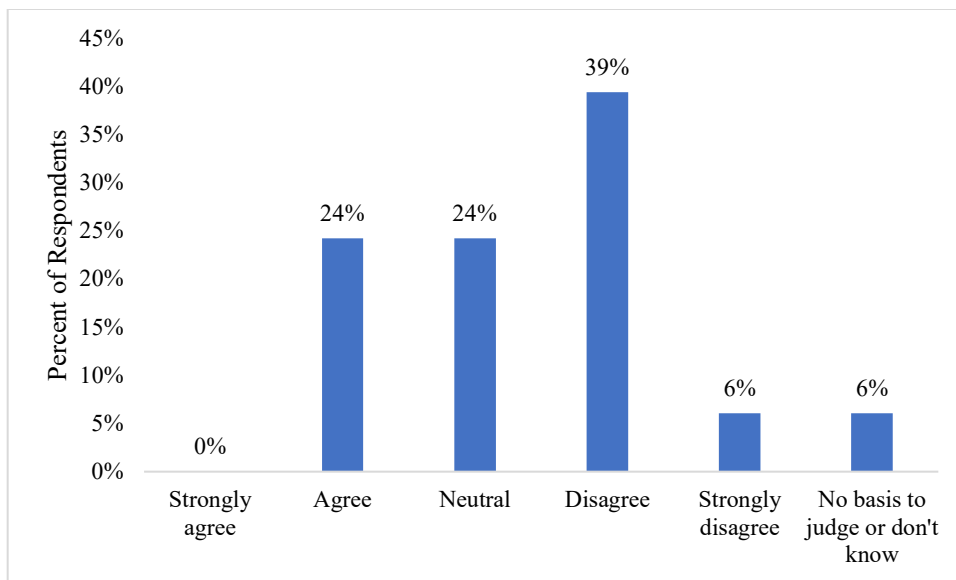
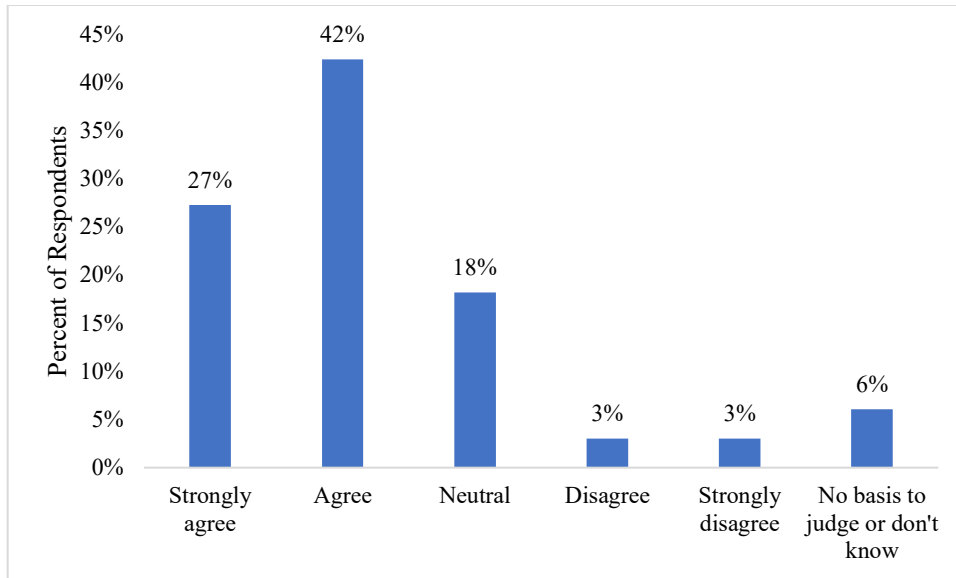## Beliefs About Release of Scientific Information to the Public

Question 19. The Editorial Review Board process is consistent

Question 20. The clearance procedure for scientific papers is transparent

Question 21. I can accurately predict the amount of time it will take to clear a scientific paper

Question 22. The process in my office for deciding who can attend and participate in meetings sponsored by scientific or professional societies is transparent
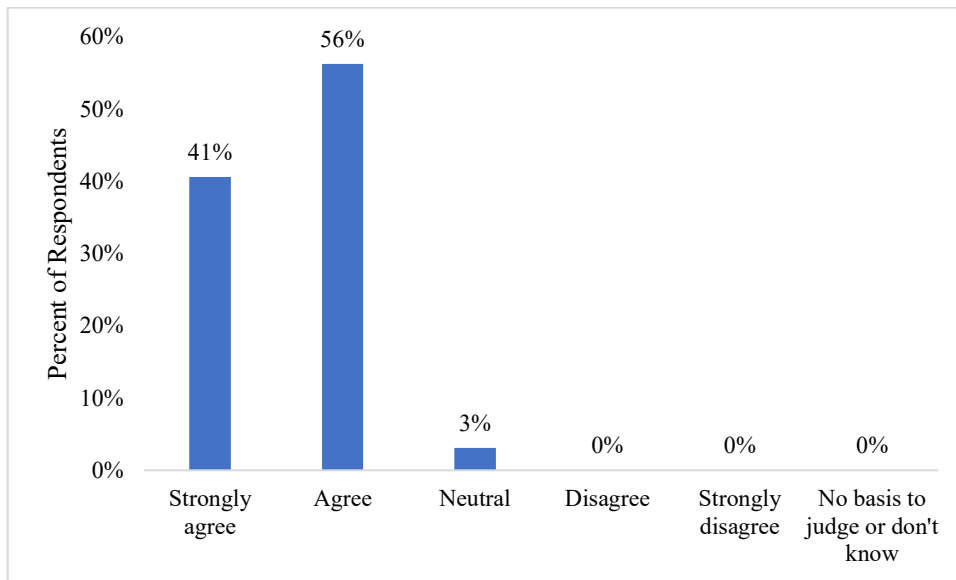
Question 23. I am provided with the appropriate time and encouragement to keep up with advances in my profession, including attending conferences and participation in scientific or professional societies
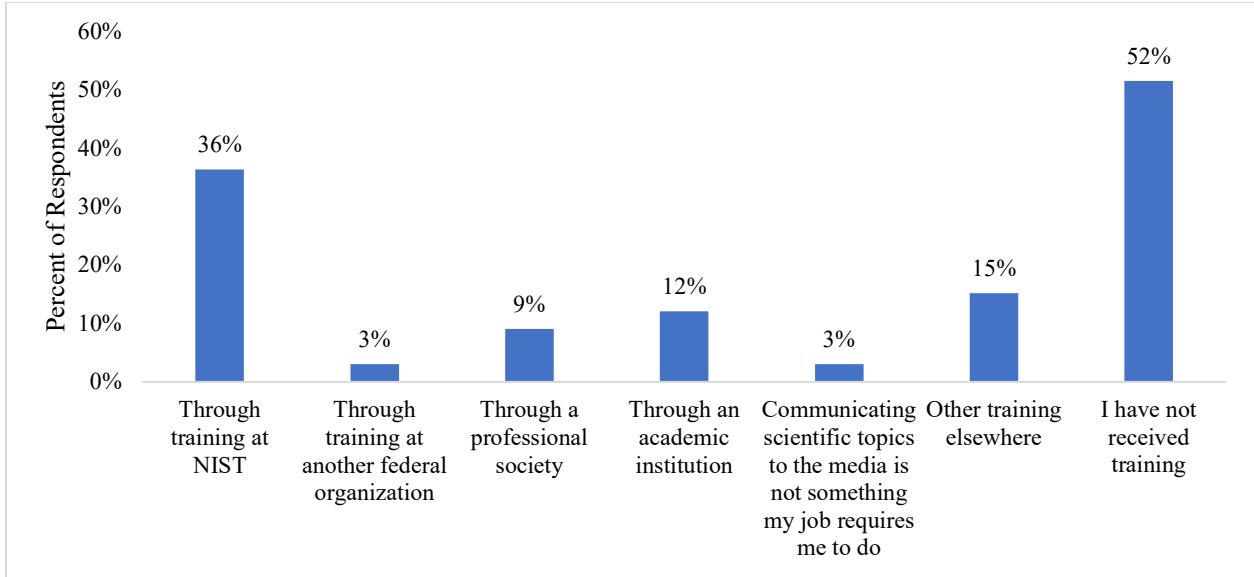
Question 24. If you have had training on how to communicate scientific topics to the media, please indicate where you received that training