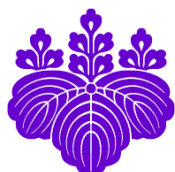




# Data Literacy Perceptions and Research Data Management Practices by Researchers in Japan

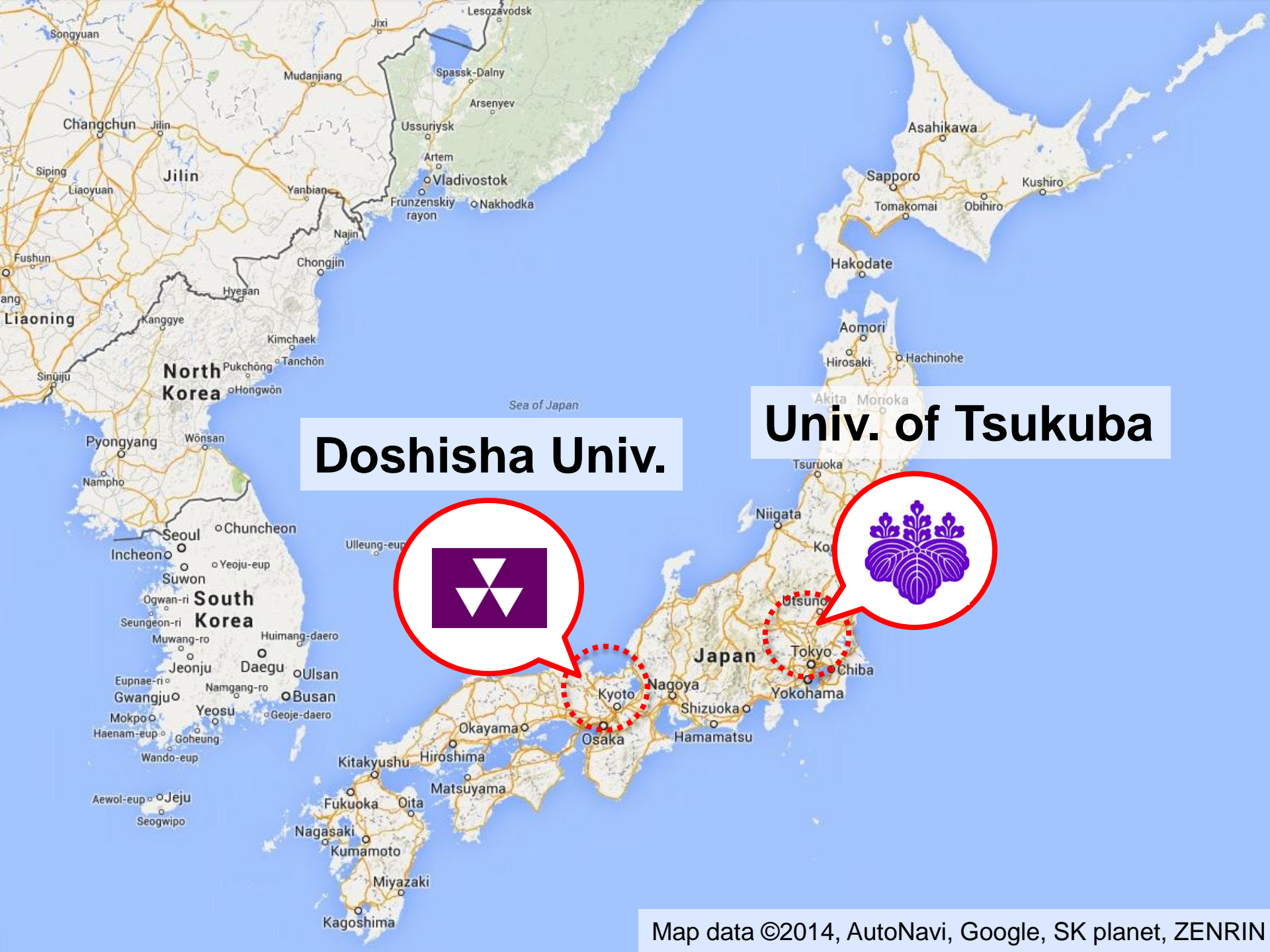
Ui IKEUCHI<sup>1)</sup>\*, Takashi HARADA<sup>2)</sup>, Sho SATO<sup>2)</sup>,  
Yukinori OKABE<sup>2)</sup>, and Hiroshi ITSUMURA<sup>1)</sup>

<sup>1)</sup>University of Tsukuba, Japan; <sup>2)</sup>Doshisha University, Japan



\*oui@slis.tsukuba.ac.jp / ikeuchi.ui@gmail.com  
<http://orcid.org/0000-0002-5680-1881>





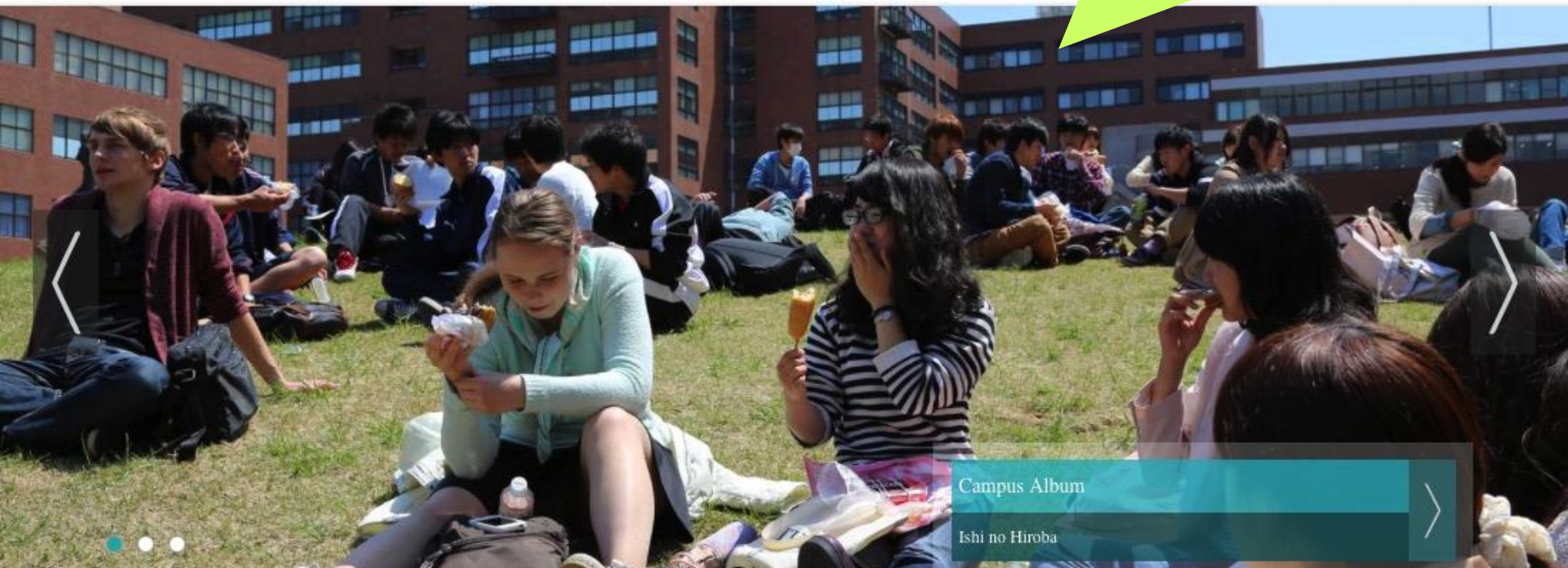
**Doshisha Univ.**

**Univ. of Tsukuba**

# University of Tsukuba



**5 Libraries**  
**16,654 students**



Campus Album

Ishi no Hiroba

## National Research University

<http://www.tsukuba.ac.jp/en/>



# Doshisha University



**26 Libraries**  
**29,459 students**

A large banner for the 'International Science and Technology Course' at Doshisha University. The banner features a collage of images showing students in various scientific and technological settings, including a laboratory, a classroom, and a robotic hand. The text 'International Science and Technology Course' is prominently displayed in white on a dark blue background. Below the main title, a smaller text box reads 'Doshisha University International Science and Technology Course'. At the bottom of the banner, there are five smaller images, each with a caption: 'Advanced Doctoral Program', 'International Science and Technology Course', 'The Institute for the Liberal Arts', 'Global MBA', and 'Prospective International Students'.

Private Research University

<https://www.doshisha.ac.jp/en/index.html>

# Contents

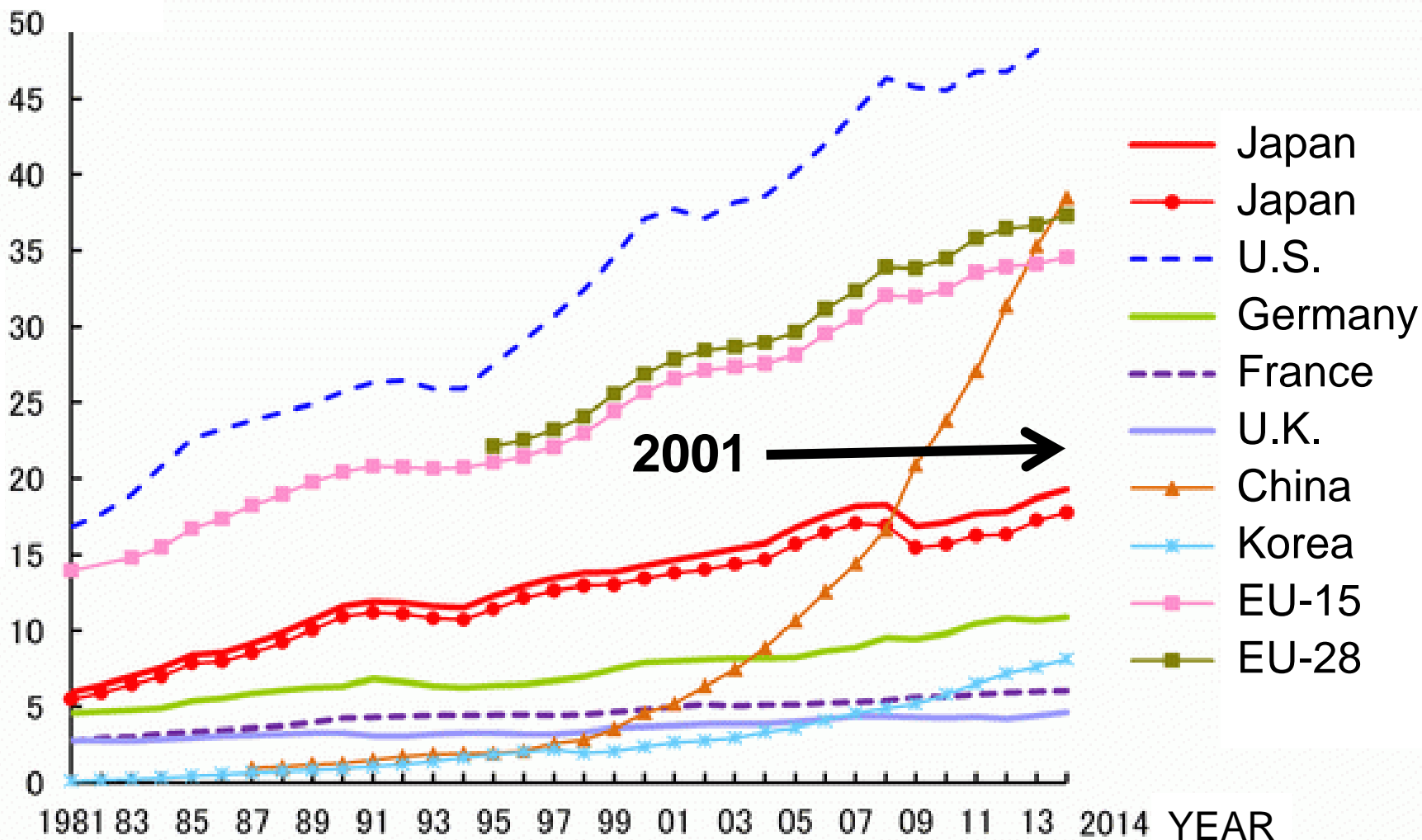
1. Introduction – Researchers in Japan
2. Methods
3. Respondents Overview
4. Results & Discussion
5. Conclusion
- ❖ Acknowledgements

# 1. Researchers in Japan



# R&D expenditure [1981-2014]

Trillion, JPY

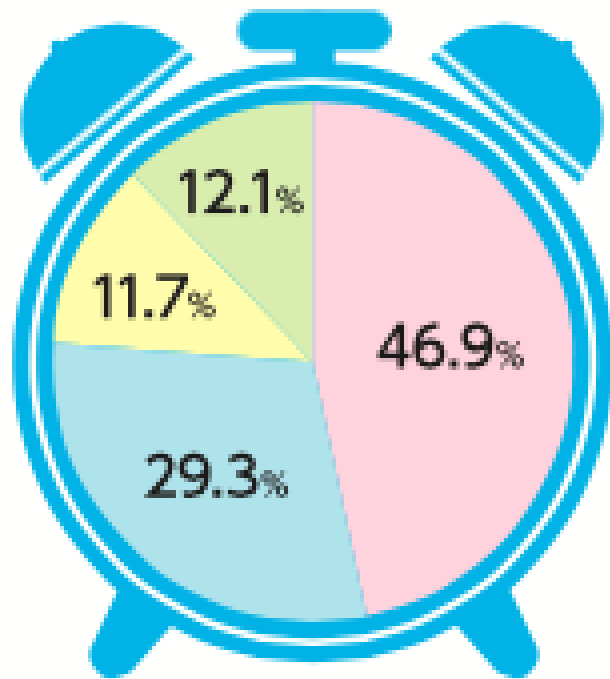


NISTEP. Science and Technology Indicators 2016

[http://data.nistep.go.jp/sti\\_indicator/2016/RM251\\_11.html](http://data.nistep.go.jp/sti_indicator/2016/RM251_11.html)

# Research Time

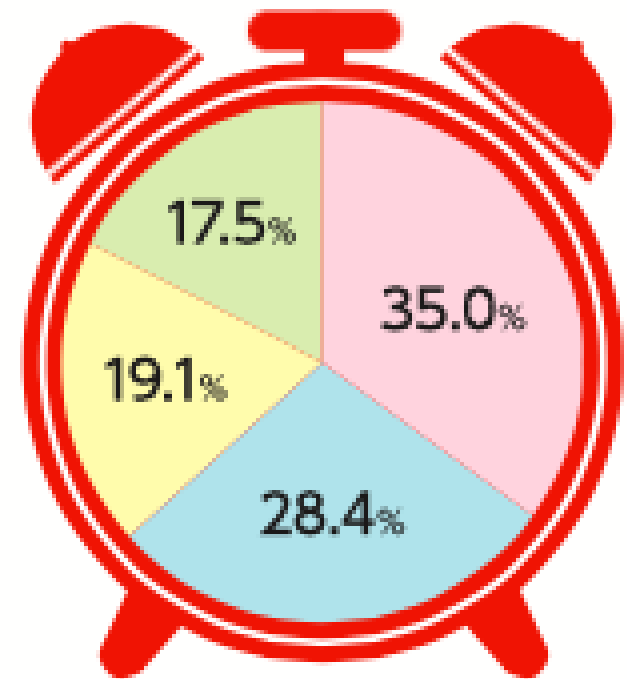
## Ideal



**46.9%**

- Research
- Education
- Social Service
- others

## Reality



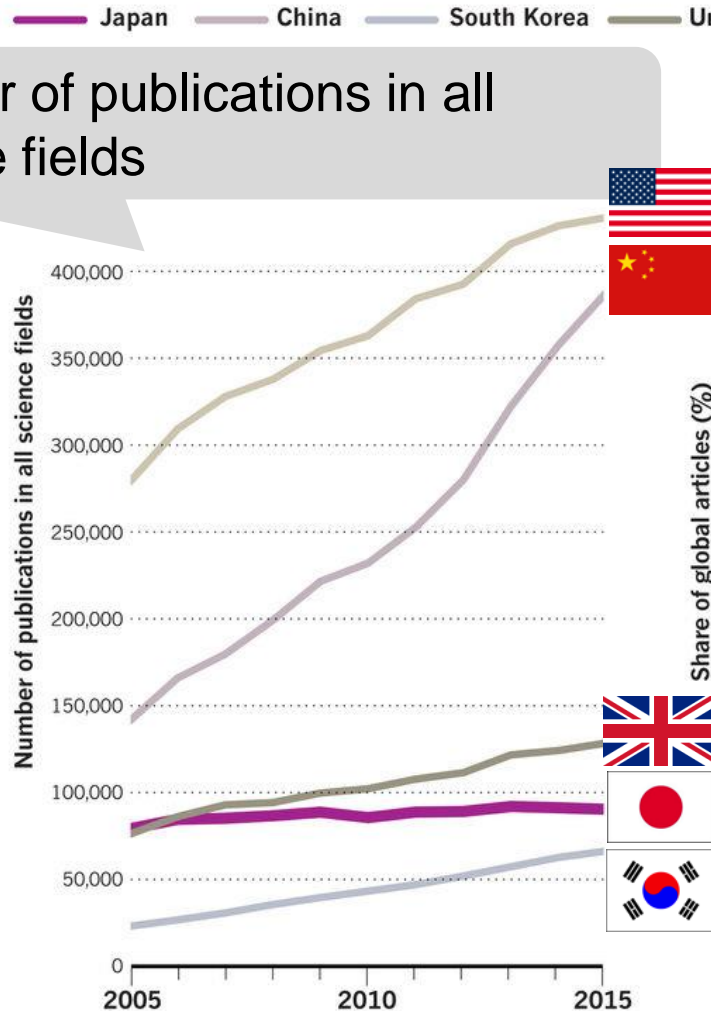
**35.0%**

**GAP**

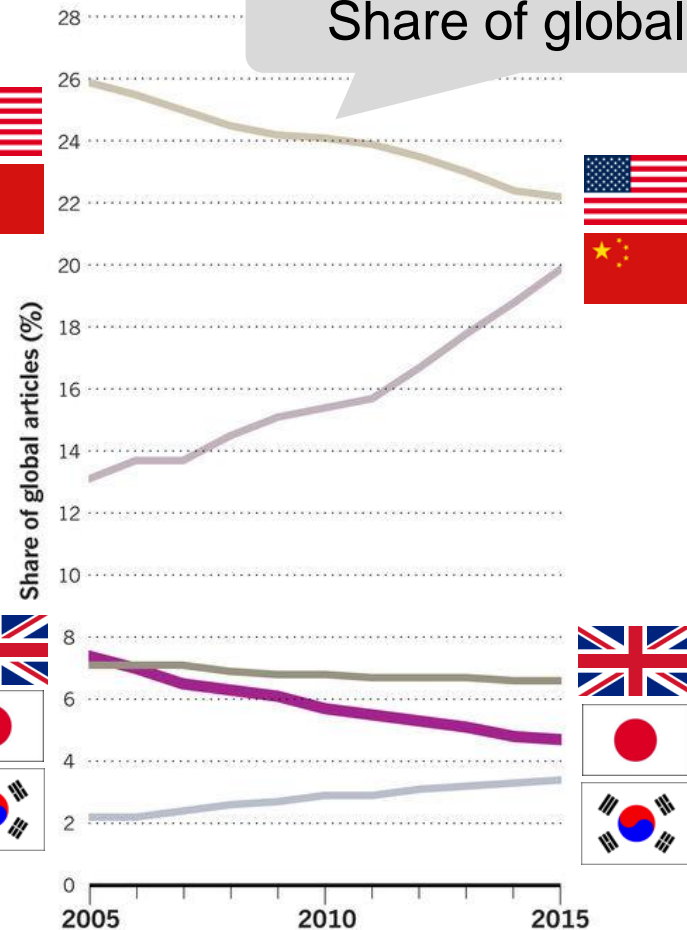


# Declining article productivity

Number of publications in all science fields



Share of global articles



Fuyuno, I. What price will science pay for austerity? Nature 2017, 543, S10–S15 doi:10.1038/543S10a

# Open Research Data Policies in Japan

2015.3	<b>Increasing Scientific Research Transparency</b> (Science Council of Japan)
2015.3	Promoting Open Science in Japan: Opening up a new era for the advancement of science (Expert Panel on Open Science, based on Global Perspectives Cabinet Office)
2016.1	<b>5th Science and Technology Basic Plan: 2016-2020</b> (Cabinet Office, Government of Japan)
2016.2	Data Management Policy for Strategic Basic Research Programs (Japan Science and Technology Agency; JST)
2016.2	Promoting Open Access and Open Research Data (Ministry of Education, Culture, Sports, Science and Technology)
2016.7	Recommendations Concerning an Approach to Open Science That Will Contribute to Open Innovation (Science Council of Japan)
2017.4	<b>JST Policy on Open Access to Research Publications and Research Data Management</b> (JST Open Science Policy)

# Science Council of Japan (2015)

## *Increasing Scientific Research Transparency*

– Measures against scientific misconduct

Preserve research data for  
**10 years**

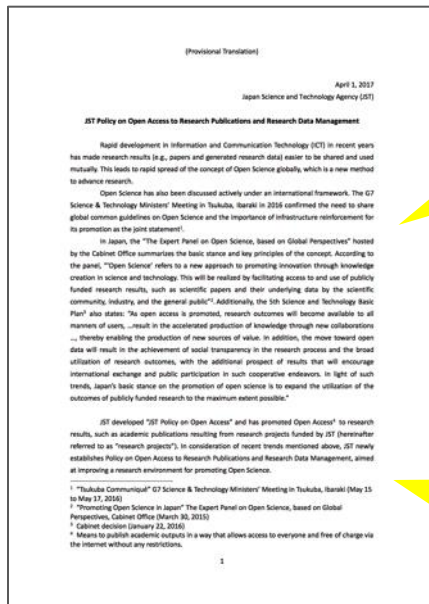


# Japan Science and Technology Agency (2017)

## *JST Policy on Open Access to Research Publications and Research Data Management (JST Open Science Policy)*

PI is required to develop a data management plan (**DMP**)

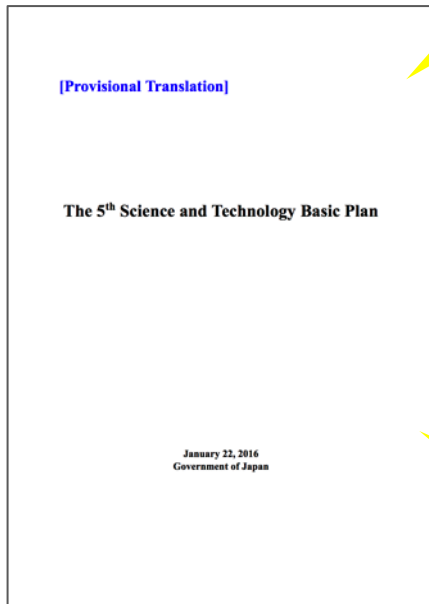
DMP should be submitted **before** the research project begins





# Cabinet Office, Government of Japan (2016)

## *5th Science and Technology Basic Plan: 2016-2020*



Increasing the total number of papers

Increasing the top 10% most-often cited papers

Promoting open science

# Researchers in Japan



Preserve data

DMP

Open Science  
Open data

# Purpose

To support researchers in Japan



Develop RDM (Research Data Management) service

- Appropriate data literacy training
- Institutional [Data] Repository

# Research Questions

1. Does researchers have open data experience?
2. Does researchers have concerns about data sharing? What is the most concern?
3. Does researchers would like to have a formal training? What is the most interesting thing?



## 2. Methods



# Questionnaire (English)

## JP Data Literacy Survey

You are invited to participate in a survey which aims to collect data about the data literacy of academics and research students in higher education institutions. From your responses we will be able to fully understand the current levels of awareness and gaps in knowledge which will help us develop appropriate data literacy training for the higher education community.

Please answer all the questions, and note that this survey is anonymous. It will take approximately 20 minutes to complete the entire survey.

By completing this survey you are consenting to the use of your data for research and dissemination purposes. If you have any questions or comments as you are going through the survey, please contact Ui Ikeuchi [oui@slis.tsukuba.ac.jp]\*.

**Thank you very much for your cooperation!**

### **Survey Period**

- 24 February - 17 March 2017

# Questionnaire (Japanese)

## データリテラシーの国際調査（日本）

近年、研究の根拠となるデータを公開し、共有する動きが国内外で盛んになっています。2016年5月のG7科学技術大臣会合 ([http://www8.cao.go.jp/cstp/kokusaiteki/g7\\_2016/2016communique.html](http://www8.cao.go.jp/cstp/kokusaiteki/g7_2016/2016communique.html))や内閣府による第5期科学技術基本計画（2016～2020年度）

(<http://www8.cao.go.jp/cstp/kihonkeikaku/index5.html>)においても研究データや論文へのアクセスを推進する「オープンサイエンス」が分野横断的な課題とされています。大学による取り組みも進められており、筑波大学では中期計画として、研究成果の発信によるオープンサイエンスを推進します（中期計画33<KPI：平成33年度までに研究成果の統合的データベースの構築）。多くの分野ではデータ公開が通常の研究活動に含まれていないため、適切なトレーニング（研修や教育）の必要があると考えられます。[例：エディンバラ大学 (<http://www.ed.ac.uk/information-services/research-support/research-data>) のデータリテラシーコース（MANTRA (<http://datalib.edina.ac.uk/mantra/>)）やワークショップ

Added explanations about data policies in Japan

そこで、大学の研究者と博士後期課程の大学院生を対象としたデータリテラシーに関する国際アンケートを実施します。調査の目的は、高等教育コミュニティのための適切なデータリテラシーのトレーニングを構築するために、現状を明らかにすることです。データ管理や公開のご経験がない方の回答も参考になりますので、ぜひ率直なご意見をお聞かせ下さい。

## Eliminate bias

しくお願いいたします。

*“Respondents without experience of RDM or Open Research Data are also welcome.”*



# Questionnaire (Japanese)

19 []以下の質問について、あてはまるものをお選び下さい  
＊

各選択肢について、適切な回答を選択してください。

はい

わからない

いいえ

所属大学にはデータ管理計画（Data Management Plan: DMP）<sup>\*</sup>がありますか？（<sup>\*</sup>研究に用いるデータの種類・管理・公開・保存方法などを記載した計画書のこと、大学や助成機関に提出する。詳しくは「研究データ管理

(<http://id.nii.ac.jp/1280/00000195/>)」

参照)

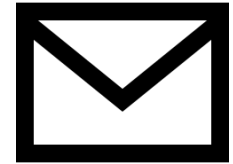
Added explanations about  
**Data Management Plan**

Hyperlink to NISO *Research Data Management*  
(Japanese translation)



# Email Invitation

## ■ Sending from



- University of Tsukuba Library
- Department of Research Promotion, Univ. of Tsukuba
- Organization for Research Initiatives and Development, Doshisha University
- The authors

# Survey Outline

## ■ Respondents

- Academic Staff in Japan
- Research Student (Ph.D Student) in Japan



## ■ Period

- 24 February - 24 March 2017

\*The University of Tsukuba approved the Research Ethics Application for this study on 4 January 2017 (No. 28-121).

# 3. Respondents Overview



# Valid responses & Current role

**Academic Staff**



**47.3%**

**Research Student**

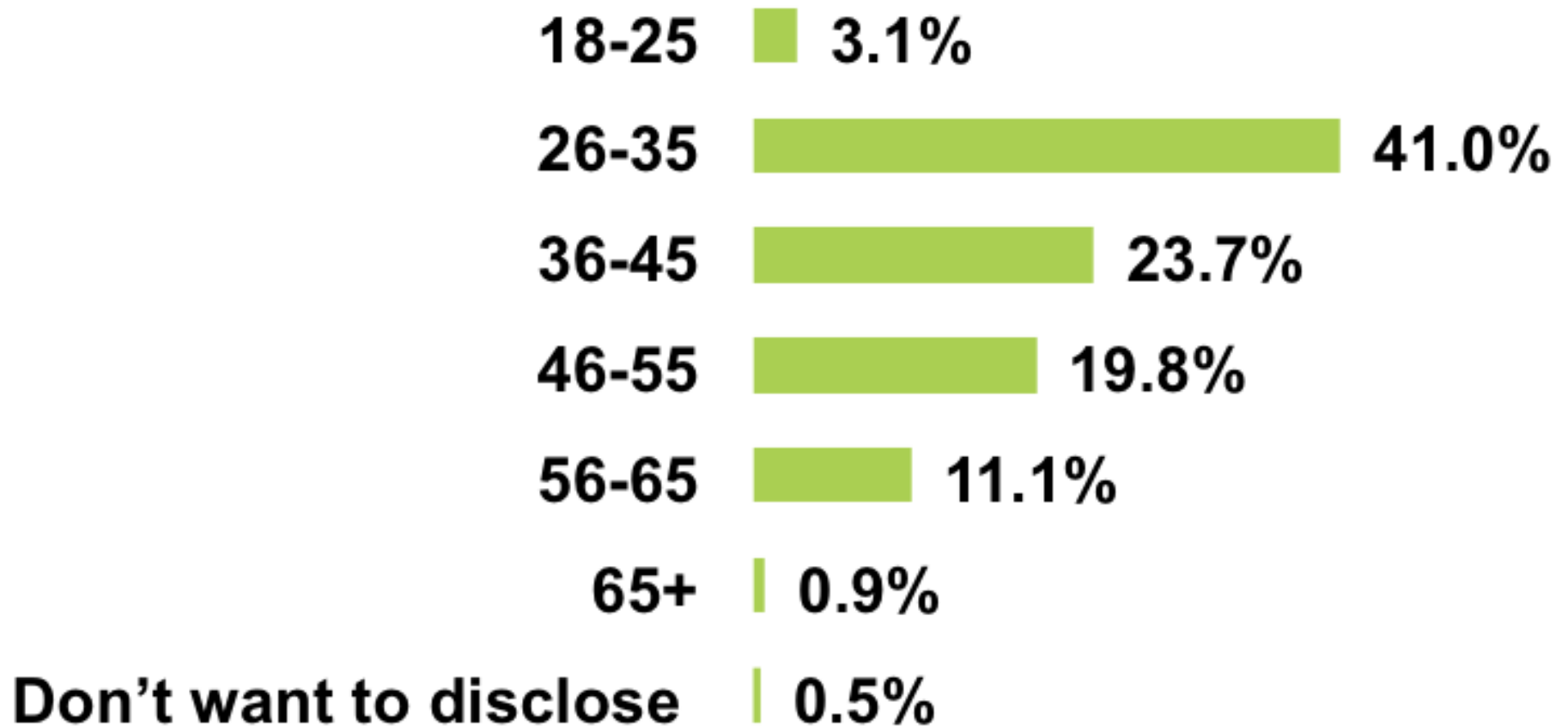


**52.7%**

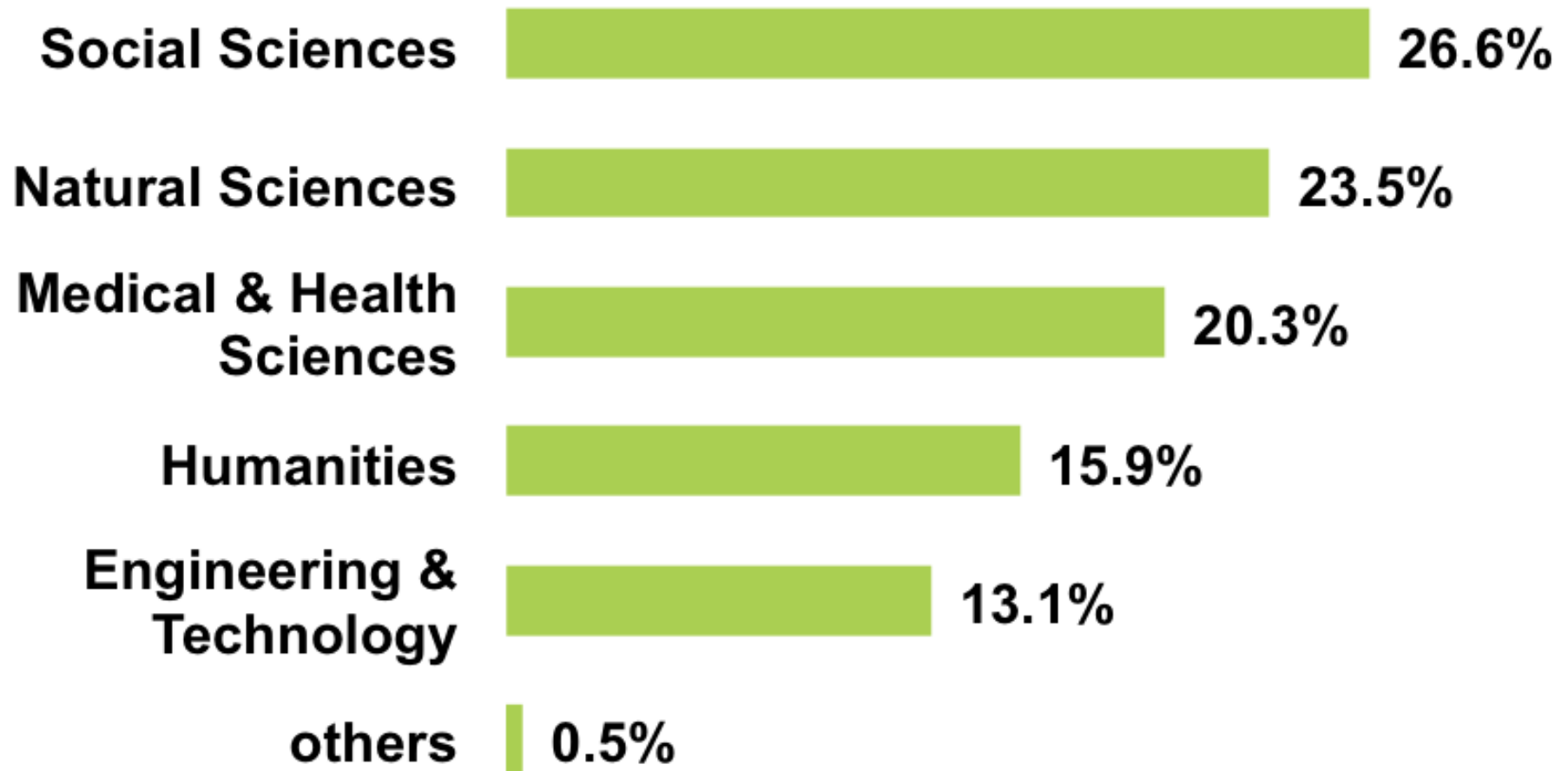
**586**



# Age (n=586)



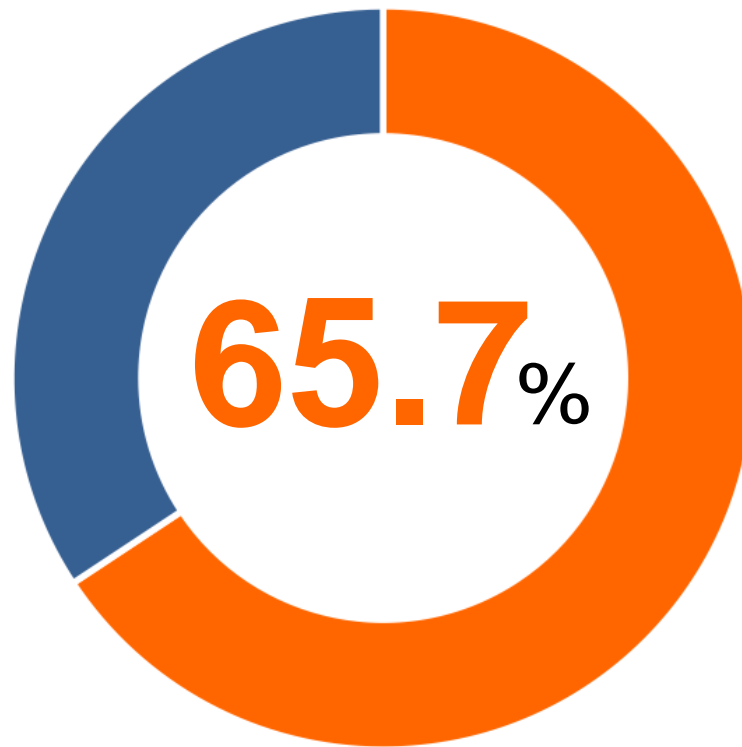
# Discipline (n=586)



# 4. Results & Discussion

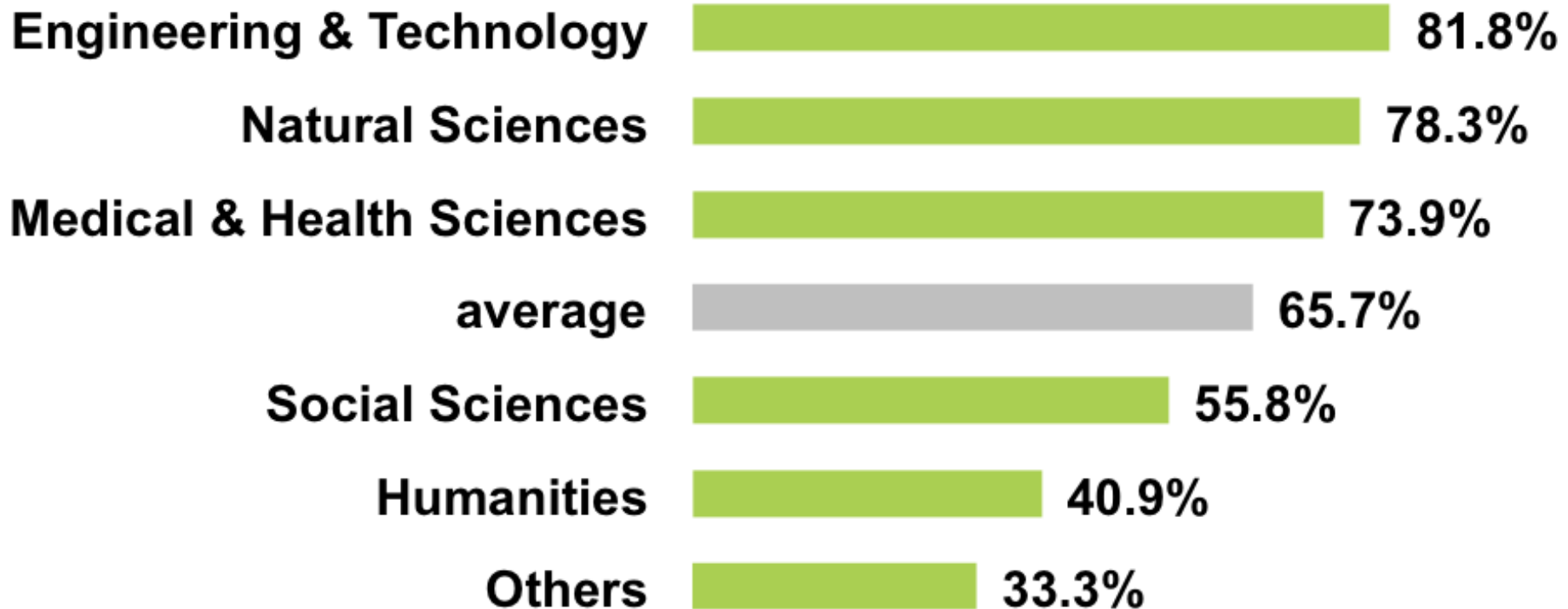


# Q16 Do you collaborate with other researchers and share data?



n=586

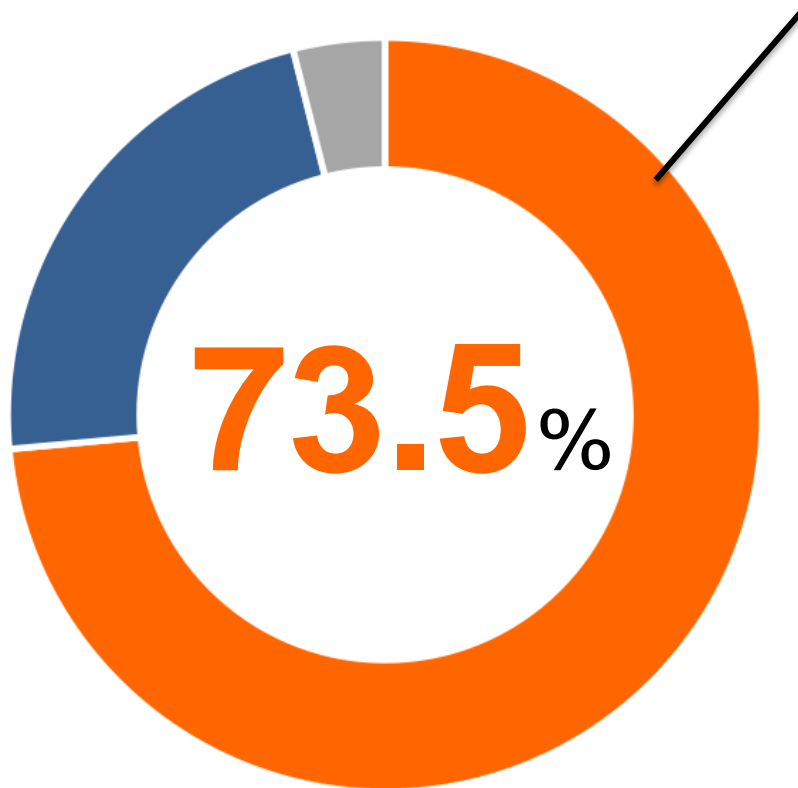
# Q16 Do you collaborate with other researchers and share data?



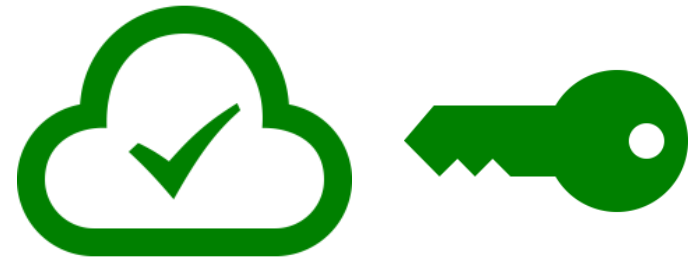
n=586,  $\chi^2 = 55.817$ ,  $p = 0.000$

# Q17 Which of the following applies to your research data?

**My data is available** under a variety of conditions



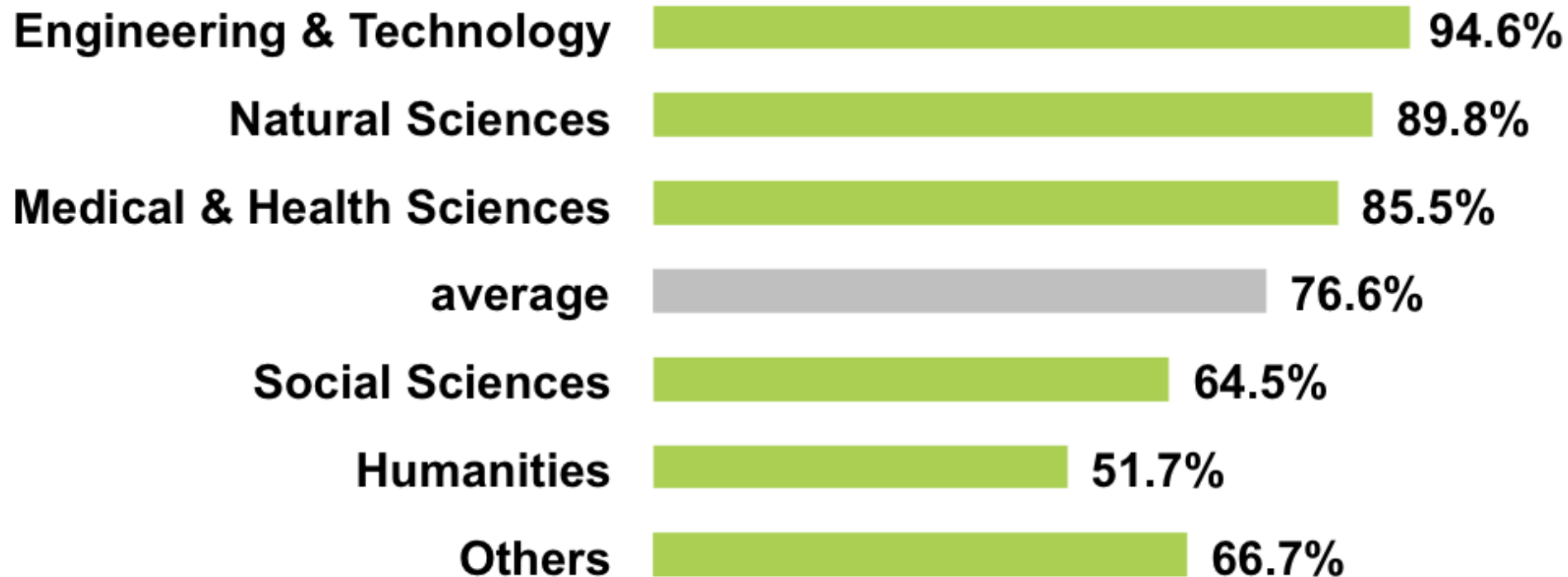
n=586





# Q17 Which of the following applies to your research data?

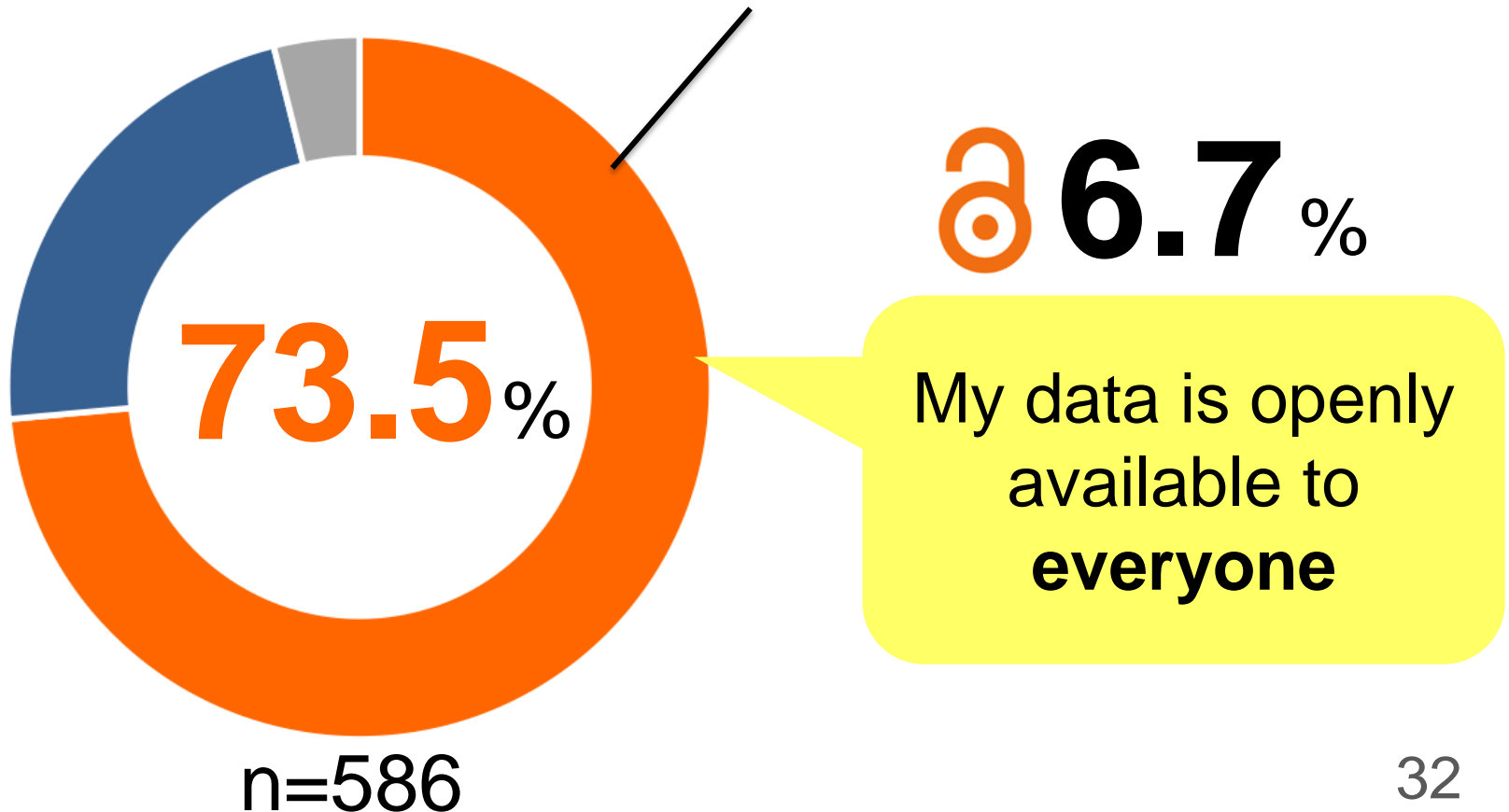
Significant difference depending on the **discipline**



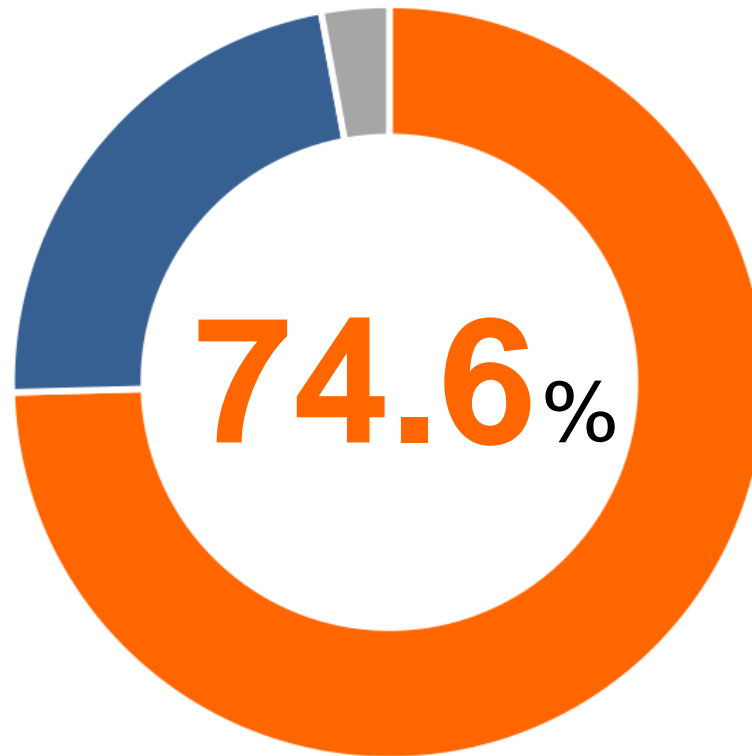
$n=563$ ,  $\chi^2 = 74.384$ ,  $p = 0.000$

# Q17 Which of the following applies to your research data?

**My data is available** under a variety of conditions



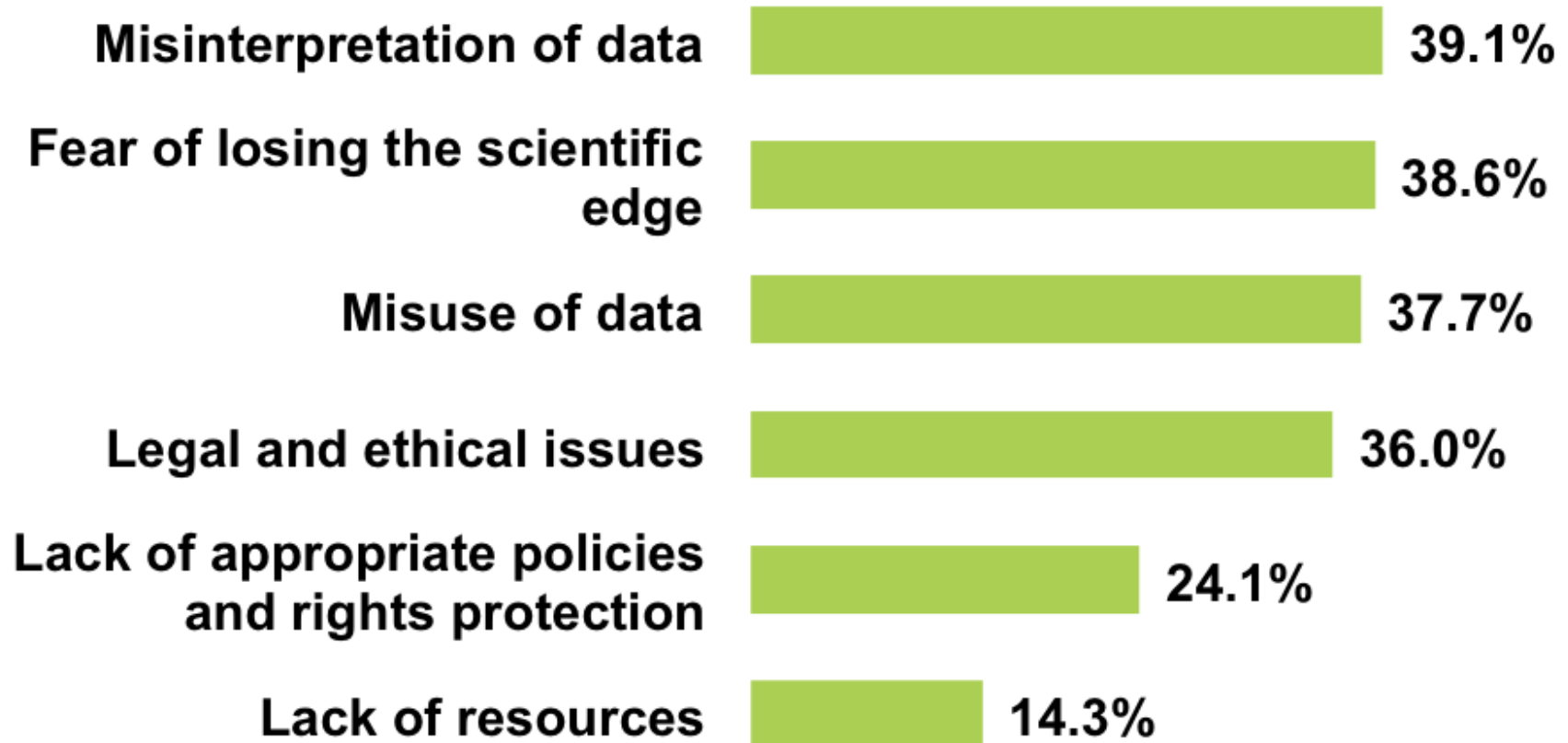
# Q18 Do you have any concerns for sharing data with others?



n=586

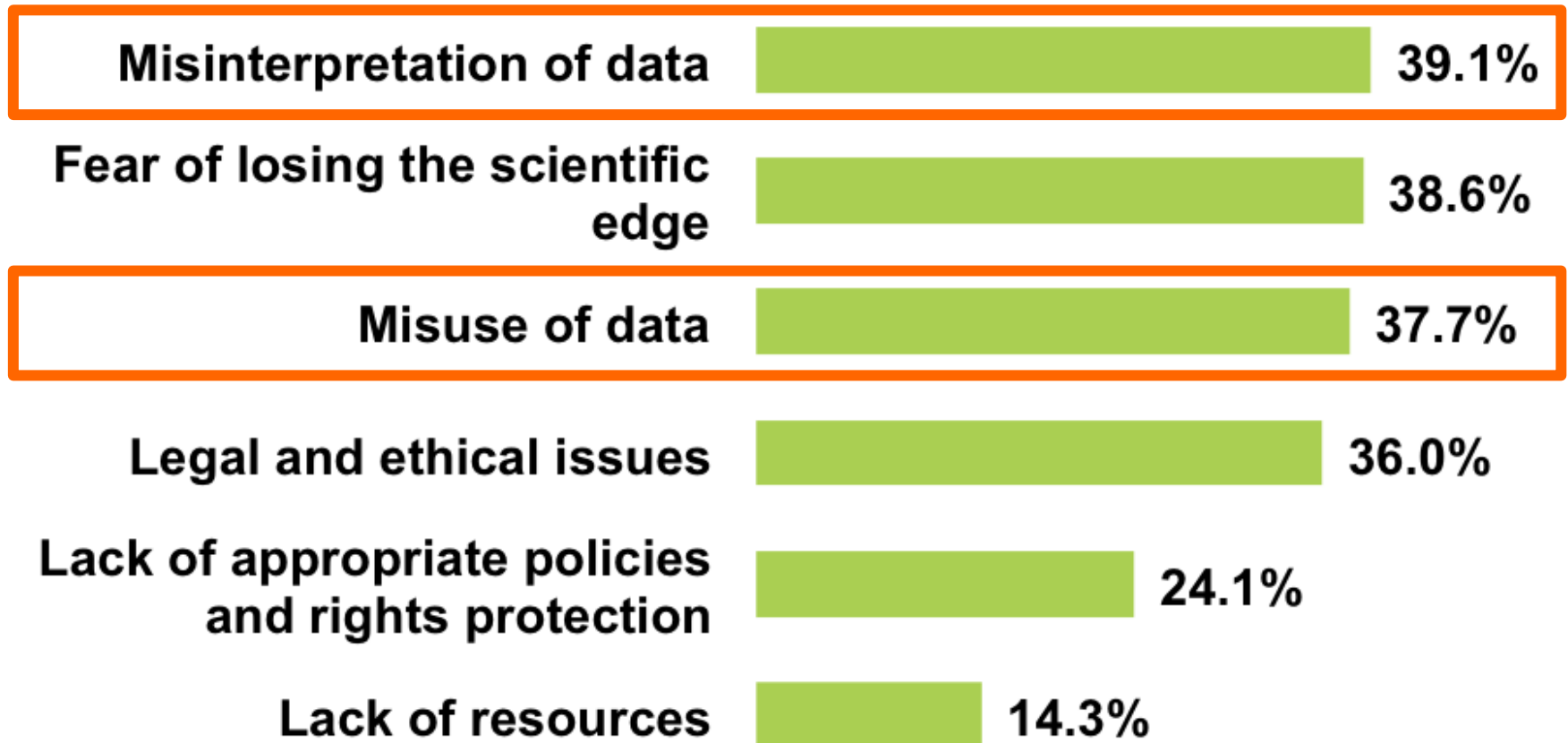


# Q18 Do you have any concerns for sharing data with others?



n=586

# Q18 Do you have any concerns for sharing data with others?



# Q18 Do you have any concerns for sharing data with others?

**Misinterpretation of data**



**39.1%**

**Fear of losing the scientific edge**



**38.6%**

**Misuse of data**

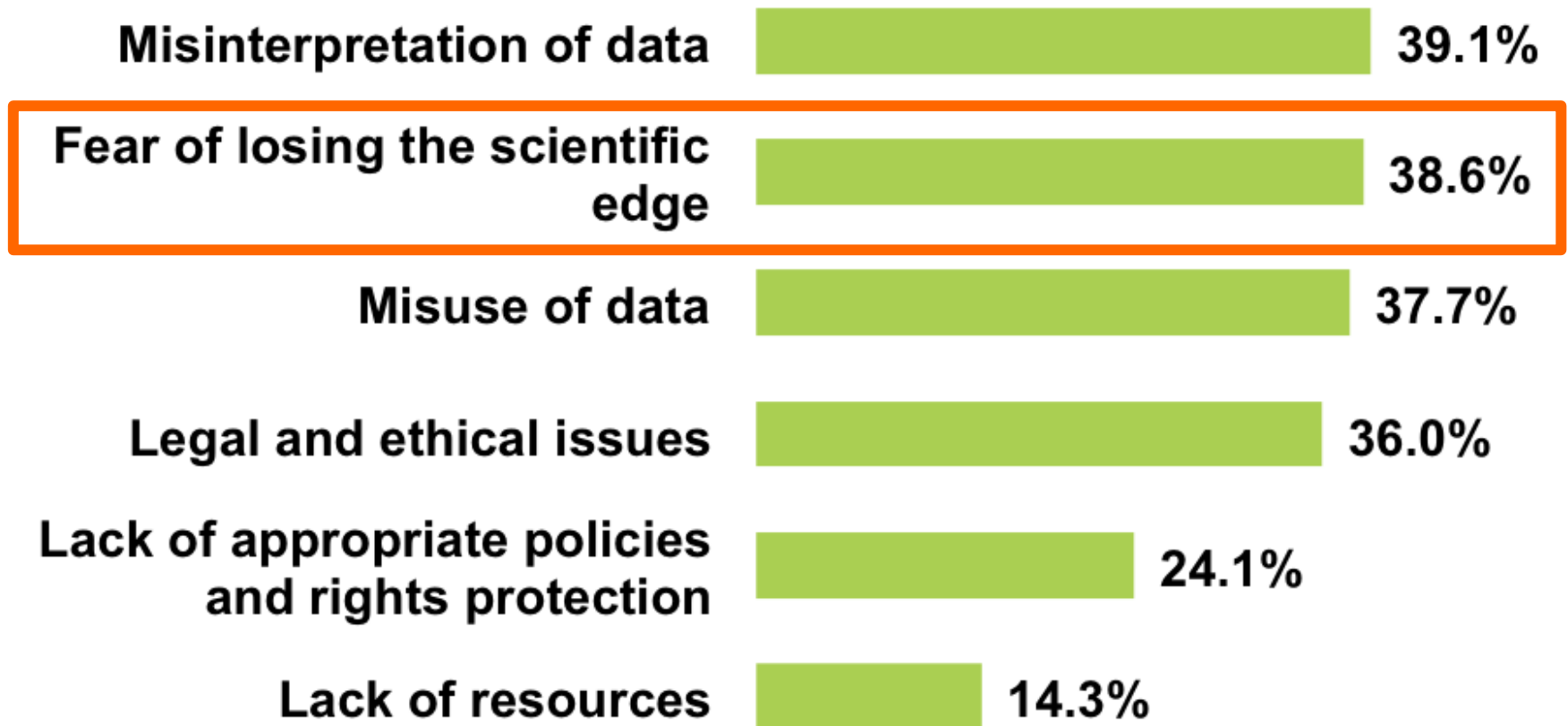


**37.7%**

- ✓ **Appropriate (interoperable) metadata**
- ✓ **Article links using permanent ID (i.e. DOI)**
- ✓ **Author(s) links using popular ID (i.e. ORCID)**



# Q18 Do you have any concerns for sharing data with others?



n=586

# Q18 Do you have any concerns for sharing data with others?

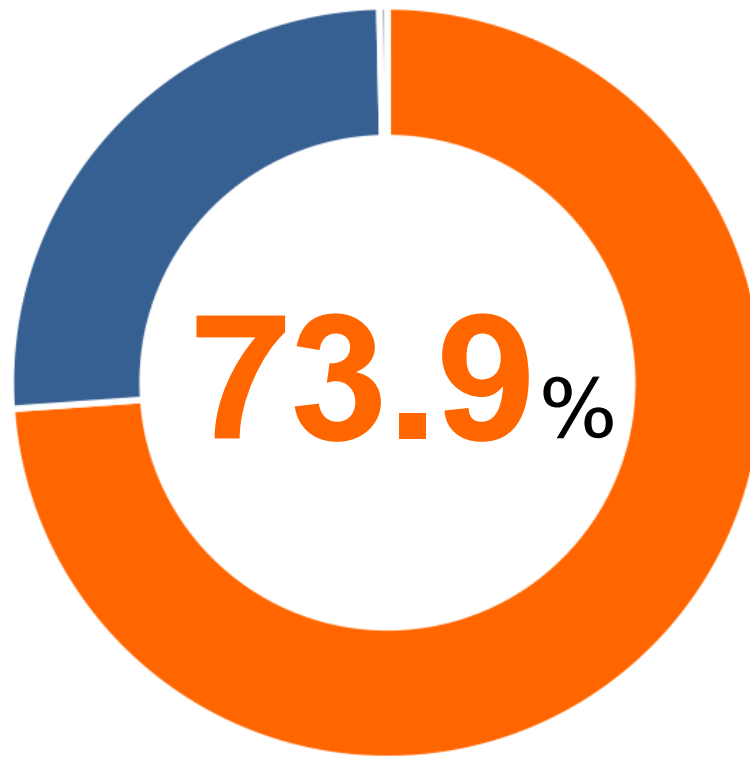
Misinterpretation of data 39.1%

Fear of losing the scientific edge 38.6%

Misuse of data 37.7%

- ✓ Research ethics education
- ✓ Data citation guidance
- ✓ Timestamp system

**Q25** Would you like to have a formal training on the following ?



n=586

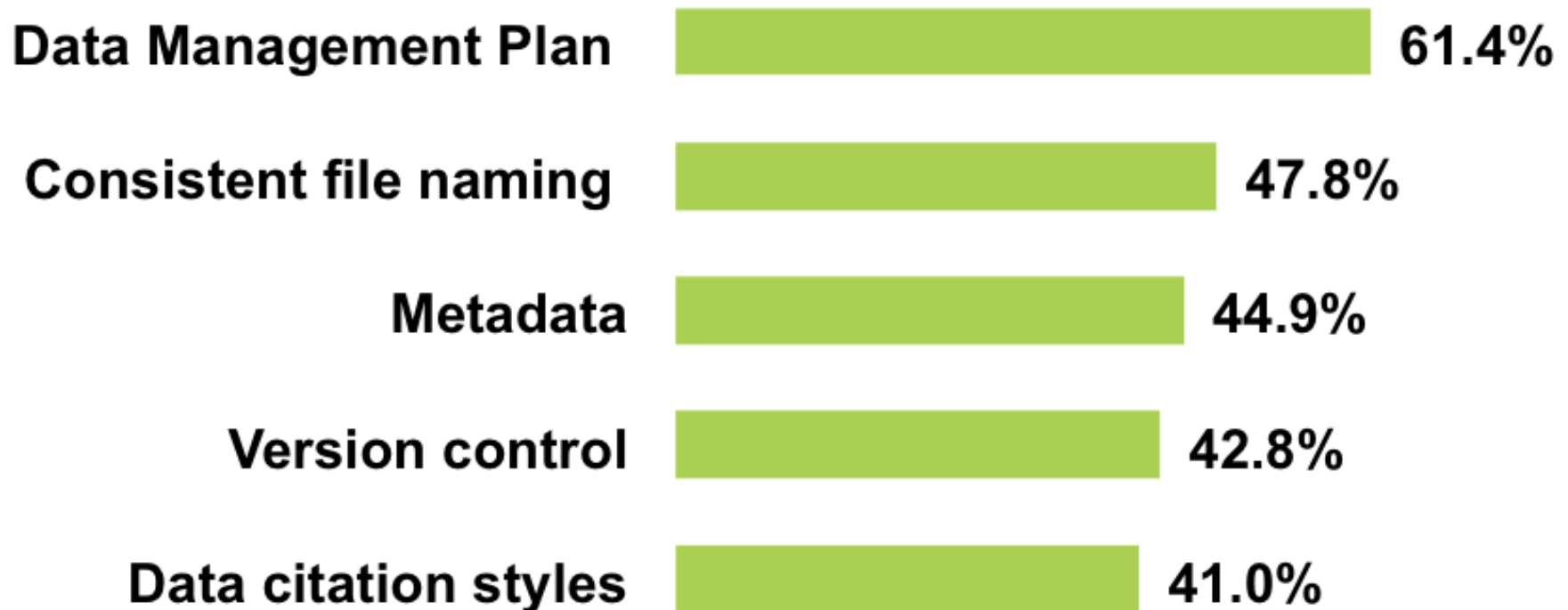


# Q18 concern(s) & Q25 training

Q25 Would like to have a formal Training	Q18 Have concern(s) for sharing data	
	Yes	No
	No	
Yes	59.1%	17.6%
No	15.2%	8.1%

n=567,  $\chi^2 = 7.450$ ,  $p < 0.01$

# Q25 Would you like to have a formal training on the following ?



n=586



# 5. Conclusion



# RQ 1 & Results

■ Does researchers have open data experience?

– Only **6.7%** 

## *New Question*

– *How can RDM service contribute to Open Research Data?*

# RQ 2 & Results

- Does researchers have concerns about data sharing?
  - **74.6%**
- What is the most concern?
  - Misinterpretation (also Losing the science edge, Misuse, and...)

# RQ 3 & Results

- Does researchers would like to have a formal training?
  - **73.6%**
- What is the most interesting thing?
  - **DMP (Data Management Plan)**

# Suggestions for RDM service

- Appropriate data literacy training
  - Provide DMP, research ethics, and data citation guidance
  - Consider the differences among disciplines
- Institutional [Data] Repository
  - Metadata, DOI, and researchers' ID
  - Timestamp



*Support researchers' RDM activities and  
reduce concerns about data sharing*

# Future work

## ■ Staff development for RDM service

–i.e. Research Data Alliance



- ✓ Education and Training on handling of research data IG (Interest Group)
- ✓ Libraries for Research Data IG



# MOOC: Introduction to RDM

## ■ Target : Research supporters

- Librarian, IT specialist, URA (University Research Assistant), ...

## ■ Nov. 2017-



# ❖ Acknowledgements



## University of Tsukuba

- Center for Artificial Intelligence Research
- Department of Research Promotion
- University of Tsukuba Library
- Overseas Academic Conference Participation Support Program



## Doshisha University

- Organization for Research Initiatives and Development