ACADEMY OF FINLAND

STATE OF SCIENTIFIC RESEARCH IN FINLAND 2016

Survey on the broader impacts of research in society

Updated 11 January 2017

Read more at: www.aka.fi/tieteentila
Planning and Management Support Unit
Academy of Finland

1. Broader impact of research in the State of Scientific Research in Finland 2016 review

A special theme in the State of Scientific Research in Finland 2016 review[1] was to explore the broader impact or research in society by combining qualitative and quantitative methods. The review analysed the different types of impact arising from research and research-based knowledge as well as the pathways through which impact is realised.

The impact of research beyond academia was explored from the direction of research activities, focusing on four different research fields:

- ecology, evolutionary biology and ecophysiology
- history
- materials science and technology
- medical engineering and health technologies

A large survey and interview dataset was collected from these research fields. This document contains information of the survey for researchers on the broader impacts of research in society. The anonymised data generated in this survey will be opened to the use of researchers and other interested parties in 2017. It can be found in a research data search service provided by the Ministry of Education and Culture (etsin.avointiede.fi/en)

2. The purpose, target group and implementation of the survey

The purpose of the survey was to collect data on the societal context of research, its pathways to impact, and its interactions and influences beyond academia. The target group of the survey consisted of researchers active in the above mentioned fields in Finland. Potential participants were identified by using the application data, expertise and networks of the Academy of Finland. From the application database, researchers in these fields who had applied funding from the Academy over the last five years (incl. those not granted funding) were included in the survey. The number of invited participants was 1 587.

The survey was implemented with an online survey tool Webropol. The survey invitation, including a personal link to the online questionnaire, was sent to potential participants by email. The survey was open from January 26 to February 10, 2016. Two reminders were sent to all non-respondents before the survey was closed.

The total number of respondents was 584; the response rate was 37%. The number of responses from each research field were:

- ecology, evolutionary biology and ecophysiology: 153
- history: 120
- materials science and technology: 149
- medical engineering and health technologies: 83

Participants could identify themselves as representing more than one of the above research fields. There were 15 respondents who had selected two research fields (in most cases, medical engineering and health technologies together with materials science and technology). The responses of these participants are

[1] The review (available in Finnish only) can be found in pdf-format at www.aka.fi/tieteentila.

included in the analyses of both research fields. In addition, the survey was responded by 94 persons who did not identify themselves with any of the four research fields, or were no longer active in research. Their responses were excluded from the data. The number of individual respondents within the target group was 490.

3. Cover letter

Dear researcher,

The Academy of Finland has reviewed the state of scientific research in Finland regularly since the 1990s. The reviews have focused on the resources, outputs and scientific impact of Finnish universities and government research institutes by discipline and organisation. As a special theme in the State of Scientific Research in Finland 2016 review, we also survey the broader impacts of research in society. Our goal is to make various impacts visible and illustrate their pathways beyond academia.

Research impacts beyond academia are surveyed in four research fields: 1) ecology, evolutionary biology and ecophysiology, 2) history, 3) materials science and technology, and 4) medical engineering and health technologies. The target group of this survey consists of researchers active in these fields in Finland. Respondents have been identified by using the application data, expertise and networks of the Academy of Finland.

In this survey, we collect data on the interactions, influences and broader impacts of research. Scientific impacts as such are not included in this survey; they are assessed by other means.

We kindly ask that you respond by 9 February 2016. By responding to the survey you can also influence the way in which research impacts will be monitored in the future, and how they are discussed in science policy.

All responses will be treated confidentially. The survey results will be published as part of the State of Scientific Research in Finland 2016 review in the form of statistics, summaries and figures from which individual respondents cannot be identified. Case-specific examples will not be used without the permission of the respondent. The survey will be complemented with focus group interviews to be held with select survey respondents and stakeholder groups. For this purpose, we will identify individual respondents on the basis of their response address. Those data will only be used for correspondence with potential interviewees.

We plan to open the anonymized data generated in this survey, with the exception of responses to the open-ended questions, to the use of researchers and other interested parties after the publication of the review. In opening the data, we will follow the principles set by the Open Science and Research Initiative, see http://openscience.fi/.

We are happy to answer any questions you may have. For further information about the survey, please contact Dr Katri Huutoniemi, Science Adviser at the Academy. For more information about the State of Scientific Research in Finland 2016 review and its impact assessments, please contact Dr Anssi Mälkki, Senior Science Adviser at the Academy, or see the webpage www.aka.fi/tieteentila (>In English).

Sincerely,
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4. Questionnaire

Survey on the broader impacts of research in society

BACKGROUND INFORMATION

1. Years of experience in research after doctorate *

- ◯ Less than five years
- ◯ 5-10 years
- ◯ More than ten years

2. Which of the following disciplines does your research represent? *

- ☐ Ecology, evolutionary biology and ecophysiology
- ☐ History
- ☐ Materials science and technology
- ☐ Medical engineering and health technologies
- ☐ None of the above (The survey ends here for your part. Please finish the survey by clicking on *Next*, which will take you directly to the last page to submit your responses.)

3. Which of the following descriptions best captures your role in academia? *

*Please answer **all** questions from the perspective of the selected role. If you are a leader of a research group, for example, think about the research of the entire group. If you work as an individual researcher, you can answer from your own perspective.*

- ◯ Leader of a broad scientific network, unit, etc. consisting of several research groups
- ◯ Leader of a research group/principal investigator
- ◯ Member of a research group
- ◯ Individual researcher
- ◯ Part-time researcher
- ◯ I am no longer active in research (The survey ends here for your part. Please finish the survey by clicking on *Next*, which will take you directly to the last page to submit your responses.)

SOCIETAL CONTEXT OF RESEARCH

4. Principal site of your research *

- ☐ University
- ☐ Government research institute
- ☐ Company
- ☐ Other, please specify

5. Objective or purpose of your research *

How compatible are the following descriptions with the purpose of your research?
(5=very compatible, 4=fairly compatible, 3=neither compatible nor incompatible, 2=fairly incompatible, 1=incompatible, IDK=I don't know)

	5	4	3	2	1	IDK
The research aims to advance scientific understanding of some phenomena without obvious links to practical practical applications or societal needs.	◯	◯	◯	◯	◯	◯
The research aims to advance scientific understanding of some phenomena of practical relevance or timeliness.	◯	◯	◯	◯	◯	◯
The research aims to find new evidence or a new perspective that transforms/renews an existing practice or conception.	◯	◯	◯	◯	◯	◯
The research aims to solve some problems or find solutions in the realm of practice.	◯	◯	◯	◯	◯	◯

6. From where has your research received funding recently?

Please select all important funding sources.

- ☐ University's or institute's own core/budget funding (other than the self-financing share required for externally funded projects)
- ☐ University's or institute's self-financing share required for externally funded projects
- ☐ Academy of Finland
- ☐ Tekes
- ☐ Other public funding from Finland (e.g. ministries), please specify
- ☐ Foundation or fund, please specify
- ☐ Company
- ☐ EU
- ☐ Other public funding outside Finland, please specify

PATHWAYS TO IMPACT

7. In what way are the new knowledge, technology or know-how, created by your research, being conveyed beyond academia? *

Please assess the importance of the following pathways to impact in terms of your research. Importance in this context refers to the actual use of the pathway.
(5=very important, 4=fairly important, 3=neither important nor unimportant, 2=fairly unimportant, 1=unimportant, IDK=I don't know)

	5	4	3	2	1	IDK
Knowledge is disseminated through coordinated actions with other research fields (e.g. via multidisciplinary publications, conferences)	○	○	○	○	○	○
The results are transferred to potential users (e.g. the utilization of models, patents, guidelines)	○	○	○	○	○	○
Research information is made openly accessible to the wider use (e.g. opening research data, open access publishing)	○	○	○	○	○	○
Research is discussed with various stakeholders (e.g. at meetings, workshops)	○	○	○	○	○	○
Knowledge is interpreted for a general audience (e.g. via popular articles, exhibitions)	○	○	○	○	○	○
Knowledge walks with skilled people (e.g. expert mobility and training)	○	○	○	○	○	○
Researchers take action to influence others (e.g. public comments, appearances, lobbying)	○	○	○	○	○	○
Research is done in an interactive process that involves actors beyond academia (e.g. participatory research, co-design)	○	○	○	○	○	○
Acquiring new knowledge is already an intervention (e.g. addressing unquestioned beliefs or silenced issues, running social experiments)	○	○	○	○	○	○

8. To illustrate your selections above, please briefly describe the pathways to impact that are most important to your research.

9. Please identify one or more of your publications or other outputs that have had an influence beyond academia.

Give the exact title and publication details of the output (or other identifiers) – we may trace its diffusion and use. Give also your own idea of where and how the publication etc. has been influential. The potential impacts of your research will be surveyed more extensively in later questions.

INTERACTION

It is often argued that research impact emerges through productive interactions. Interaction can be either direct (personal contacts) or indirect (e.g. the media, publications) and it can range from informal encounters to well-established forms of cooperation (e.g. advisory boards). In this section, we survey researchers' various interactions beyond their own scientific community. As different aspects of interaction are covered by separate questions, we recommend taking a look at the whole section (i.e. this page) before answering the questions.

10. What kinds of stakeholders, organisations or actors has your research deliberately interacted with?

Please select all groups with whom you have actively shared knowledge or viewpoints relevant to the research, such as about the framing of research problems or the meaning of research results. (If you have interacted with an actor that represents more than one of the following groups, select a group that best captures the interests of the actor in terms of your research.)

- ☐ Academic actors, beyond the scientific community in your field (e.g. other fields of research, other types of organisations) [A]
- ☐ Educational actors, beyond the scientific community in your field (e.g. polytechnics, curricula designers) [B]
- ☐ Industry and commerce (e.g. companies) [C]
- ☐ Public administrative actors (e.g. officials, policy-makers) [D]
- ☐ Civil society actors (e.g. nongovernmental organisations, societies, clubs) [E]
- ☐ Ordinary citizens or the general public (e.g. patients, consumers) [F]
- ☐ Other, please specify [G]

11. In what roles have the above stakeholders acted in your research?

If you selected more than one stakeholder group above, please specify the role(s) of each group by entering the letter (A–G) of that group after the selected role(s). One stakeholder group can have several roles.

- ☐ As a research partner
- ☐ As an adviser or overseer
- ☐ As a financial supporter
- ☐ As an active follower
- ☐ As an informant, inspirer or assistant
- ☐ As a knowledge user or beneficiary
- ☐ As a mediator or critic
- ☐ In another role

12. To illustrate your selections above (questions 10 and 11), please identify some of the most important stakeholders, organisations or actors that your research has interacted with, and tell a few words about the interaction.

Our goal is to understand the patterns of interaction. Case-specific examples will not be reported without the permission of the respondent.

13. Besides productive interactions, what other actions have you taken for your research to make an impact in society?

IMPACTS

The questions (14-17) in this section are based on the idea that research has an impact beyond academia when it contributes to developments that are considered valuable in society. Our goal here is to inquire about the contribution of your research to various developments, not about your personal preferences or values (even if they are often interconnected).

14. What are some of the concrete contributions your research has made to developments beyond academia?

Please identify one or more ongoing developments to which your research has made a positive contribution, and briefly explain the importance and nature of your contribution (e.g. what result or viewpoint has made the difference, where, to whom it matters, and how?).

15. What kinds of factors are likely to hinder the attribution of impact to your research, and/or the potential impacts to realize? *

Please assess the validity of the following statements in terms of your research.
(5=I strongly agree, 4=I agree, 3=I neither agree nor disagree, 2=I disagree, 1=I strongly disagree, IDK=I don't know)

	5	4	3	2	1	IDK
There is a significant time lag between the research and the realization of the impact (more than ten years).	○	○	○	○	○	○
Potential impacts depend a great deal on how the research succeeds (such as in the case of high-risk, high-gain research).	○	○	○	○	○	○
The realization of impacts depends essentially on other people, or on processes over which researchers have have very limited influence.	○	○	○	○	○	○
There are clearly different opinions about the potential impacts or their desirability.	○	○	○	○	○	○

16. Please tell a few words about the challenges involved in assessing the impacts of your research.

17. Where will the potential impacts of your research be seen in the (short or) long run?

Please select all developments to which your research, if successful, can make a contribution. If the categories provided below do not (sufficiently) capture the potential impacts of your research, please type in your own description of the impacts in the open-ended question on the next page (question 18).

Public institutions and services

- ☐ Preparation of policy-making, legislation or other regulations
- ☐ Renewal of teaching curricula; educational planning
- ☐ Improvements related to other public services (e.g. public security, transportation, social services)
- ☐ Improved function of public institutions (e.g. tackling problems, open discussion forums)
- ☐ Other impact on public institutions and services, please specify

Economy and economic renewal

- ☐ Improved business capability or competitiveness of individual companies (e.g. through new or improved products or services)
- ☐ Improved prospects for employment or expert work (e.g. through making experts more attractive for recruitment)
- ☐ New business activity; attraction of investments
- ☐ Development or renewal of the economic environment; adaptive capacity of the economy (e.g. structural diversity, new modi operandi)
- ☐ Other impact on the economy and economic renewal, please specify

Health and wellbeing

- ☐ Reduced morbidity or illness; improved physical or mental health
- ☐ Reduction of social problems; improved social welfare
- ☐ Improvement of healthcare
- ☐ Management or prevention of health-related risks
- ☐ Other impact on health and wellbeing, please specify

The environment and natural resources

- ☐ Reduction of environmental stress; improved state of the environment
- ☐ Sustainable use of natural resources; protection of biodiversity
- ☐ Sustainability of the built environment, infrastructures or land use
- ☐ Management or prevention of environmental risks; improved ecological resilience
- ☐ Other impact on the environment and natural resources, please specify

Human capacities and culture

- ☐ Strengthening of civilization, citizen participation or civil activity

- [ ] Protection of cultural diversity; improved cultural interaction or coexistence
- [ ] Development of environments supporting creativity, experimentation and learning
- [ ] Development of national or international community (e.g. national identity, global justice)
- [ ] Other impact on human capacities and culture, please specify

OPEN COMMENTS AND FURTHER PARTICIPATION

18. Other comments on the broader impacts of your research or on the assessment of research impact more generally.

Feel free to complement any of your answers above.

19. Would you like to participate in a focus group interview about the broader impacts of research in your field? *

A focus group is a semi-structured interview with a selected group of individuals, who are encouraged to share their views with other group members. One focus group will involve 4–10 persons invited from within and beyond academia. The interviews will take place in Helsinki in March/April 2016.

- ◯ Yes – I volunteer to be contacted about the interview
- ◯ Possibly – I volunteer to be contacted about the interview
- ◯ No – please do not contact me about the interview

20. If you volunteer to participate in the interview, please recommend potential stakeholders to be invited to the same focus group.

If possible, also name a contact person and give his/her contact details. (If you respond to this survey via the public link instead of a personal link emailed to you, please also give your own contact details!)

THANK YOU FOR PARTICIPATING!

5. Summary of responses

BACKGROUND INFORMATION

1. Years of experience in research after doctorate

Number of respondents: 490

	Ecology, evolutionary biology and ecophysiology (N=153)	History (N=120)	Materials science and technology (N=149)	Medical engineering and health technologies (N=83)
Less than five years	28	28	25	31
5-10 years	37	40	31	18
More than ten years	88	52	93	34

2. Which of the following disciplines does your research represent?

Number of respondents: 490

	Ecology, evolutionary biology and ecophysiology (N=153)	History (N=120)	Materials science and technology (N=149)	Medical engineering and health technologies (N=83)
Ecology, evolutionary biology and ecophysiology	153	0	1	2
History	0	120	0	0
Materials science and technology	1	0	149	12
Medical engineering and health technologies	2	0	12	83

3. Which of the following descriptions best captures your role in academia?

Please answer all questions from the perspective of the selected role. If you are a leader of a research group, for example, think about the research of the entire group. If you work as an individual researcher, you can answer from your own perspective.

Number of respondents: 490

	Ecology, evolutionary biology and ecophysiology (N=153)	History (N=120)	Materials science and technology (N=149)	Medical engineering and health technologies (N=83)
Leader of a broad scientific network, unit, etc. consisting of several research groups	7	9	11	6
Leader of a research group/principal investigator	81	27	85	34
Member of a research group	36	15	30	35
Individual researcher	28	69	22	5
Part-time researcher	1	0	1	3

4. Principal site of your research

Number of respondents: 490

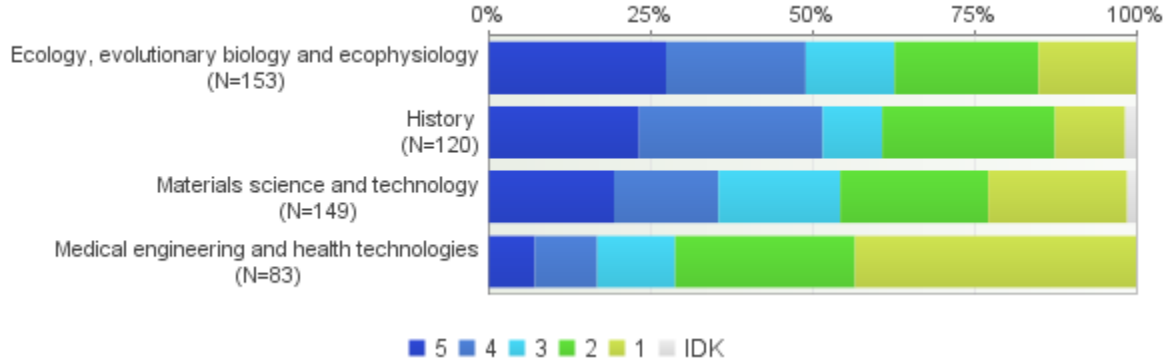
	Ecology, evolutionary biology and ecophysiology (N=153)	History (N=120)	Materials science and technology (N=149)	Medical engineering and health technologies (N=83)
University	129	113	135	74
Government research institute	23	0	15	2
Company	0	0	0	1
Other, please specify	3	8	1	10

5. Objective or purpose of your research

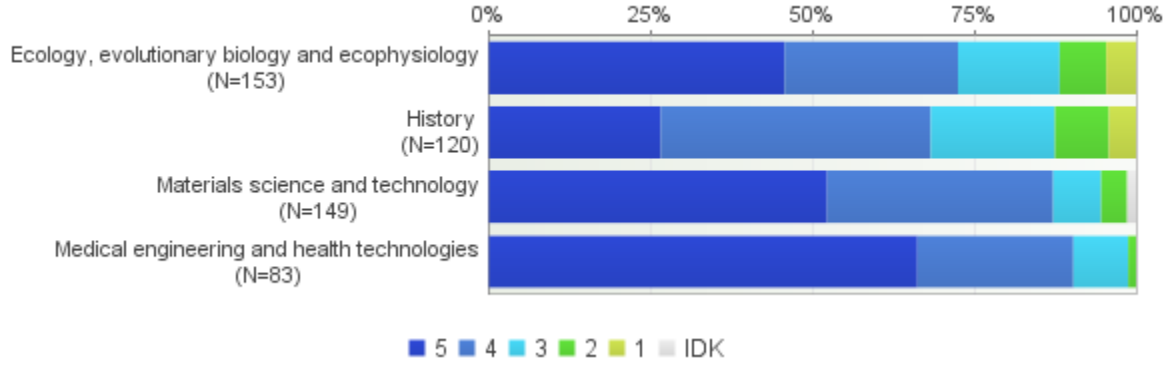
How compatible are the following descriptions with the purpose of your research? (5=very compatible, 4=fairly compatible, 3=neither compatible nor incompatible, 2=fairly incompatible, 1=incompatible, IDK=I don't know)

Number of respondents: 490

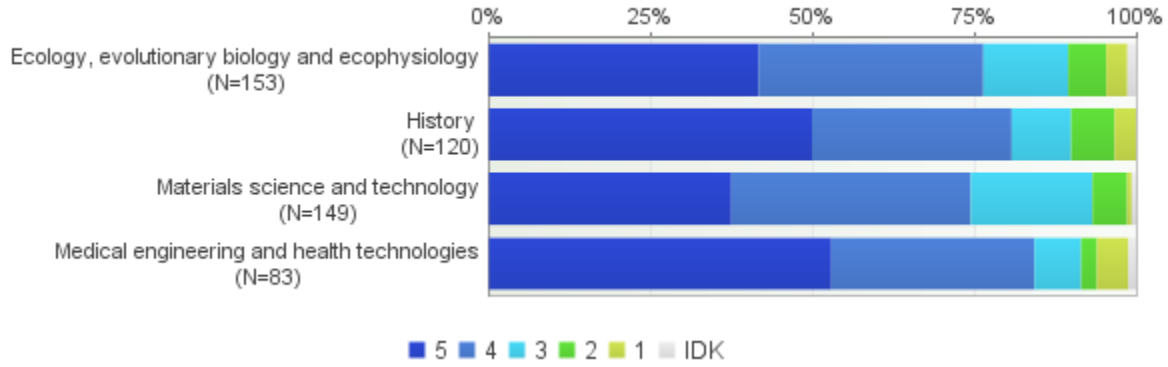
The research aims to advance scientific understanding of some phenomena without obvious links to practical applications or societal needs.



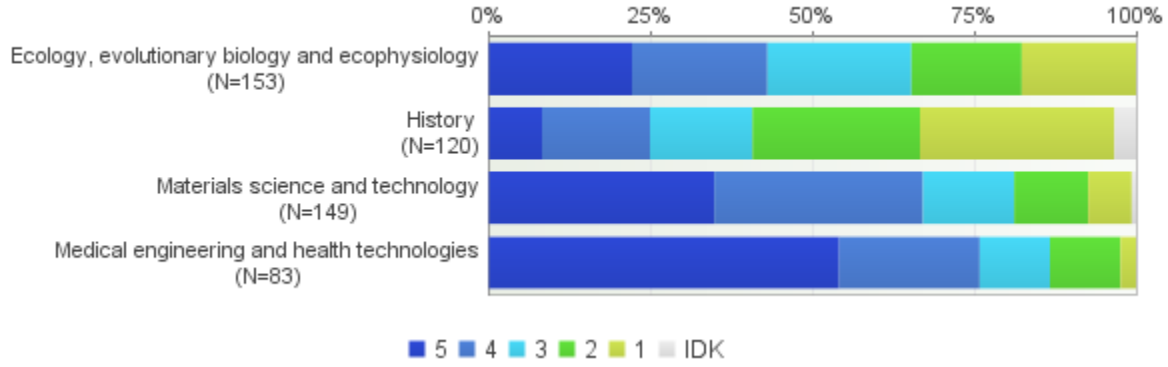
The research aims to advance scientific understanding of some phenomena of practical relevance or timeliness.



The research aims to find new evidence or a new perspective that transforms/renews an existing practice or conception.



The research aims to solve some problems or find solutions in the realm of practice.



6. From where has your research received funding recently?

Please select all important funding sources.

Number of respondents: 486

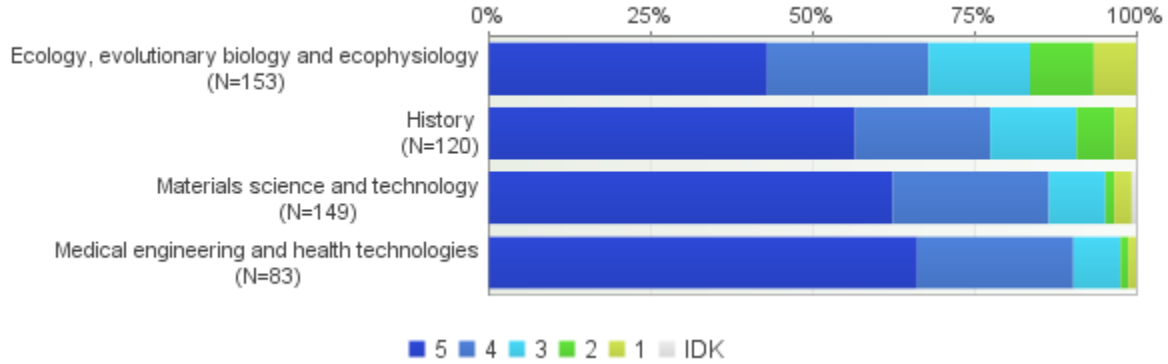
	Ecology, evolutionary biology and ecophysiology (N=152)	History (N=119)	Materials science and technology (N=149)	Medical engineering and health technologies (N=81)
University's or institute's own core/budget funding (other than the self-financing share required for externally funded projects)	60	52	90	48
University's or institute's self-financing share required for externally funded projects	44	31	63	37
Academy of Finland	114	84	120	53
Tekes	12	2	71	41
Other public funding from Finland (e.g. ministries), please specify	20	10	11	11
Foundation or fund, please specify	85	56	45	32
Company	10	2	49	21
EU	49	7	70	22
Other public funding outside Finland, please specify	21	16	13	5

7. In what way are the new knowledge, technology or know-how, created by your research, being conveyed beyond academia?

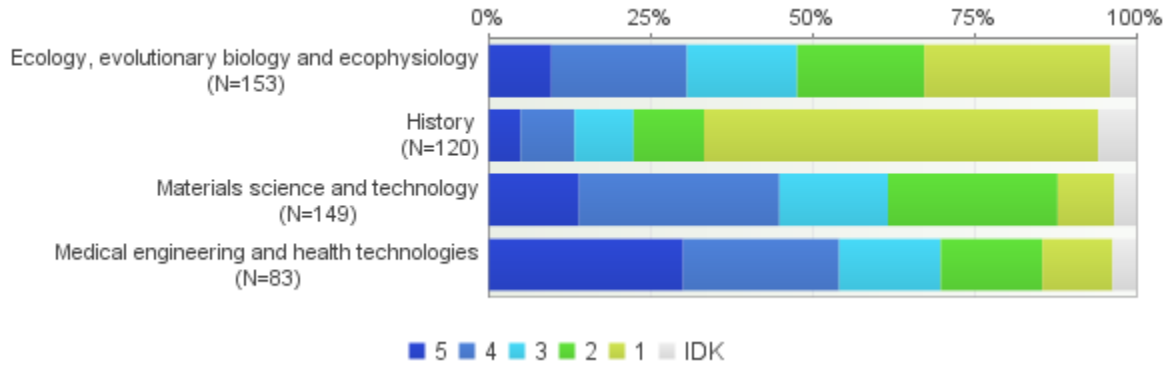
Please assess the importance of the following pathways to impact in terms of your research. Importance in this context refers to the actual use of the pathway. (5=very important, 4=fairly important, 3=neither important nor unimportant, 2=fairly unimportant, 1=unimportant, IDK=I don't know)

Number of respondents: 490

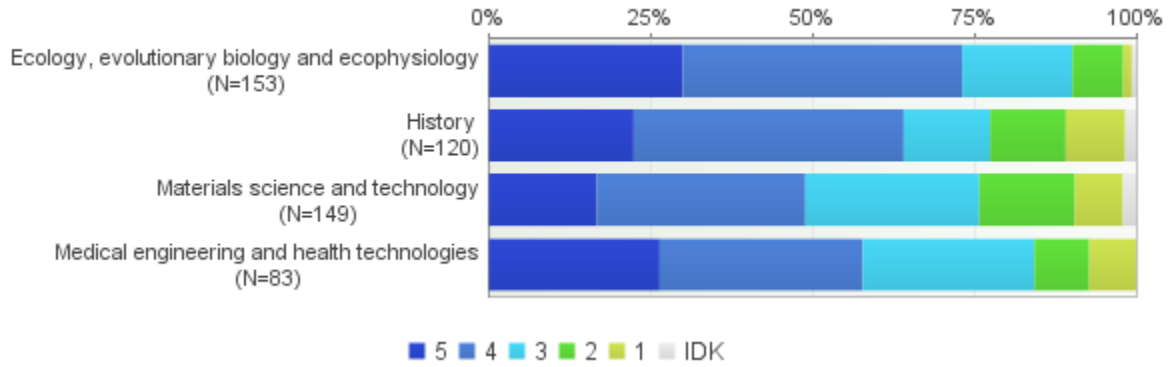
Knowledge is disseminated through coordinated actions with other research fields (e.g. via multidisciplinary publications, conferences)



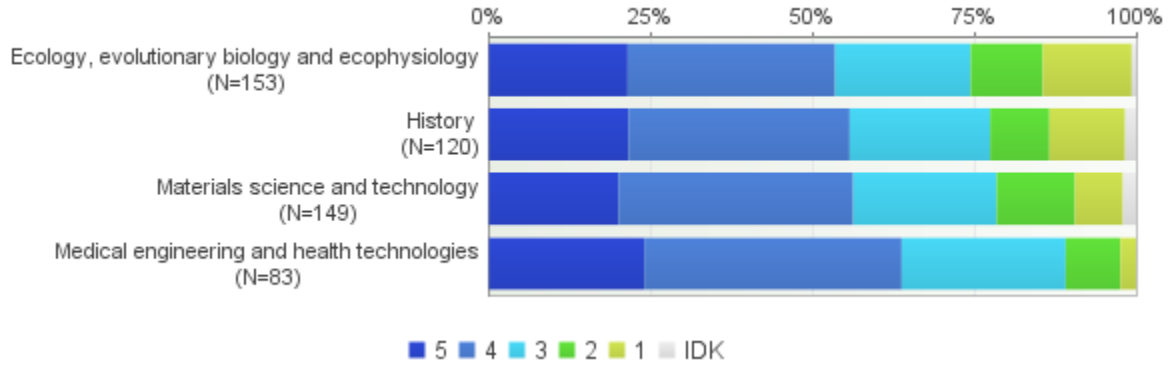
The results are transferred to potential users (e.g. the utilization of models, patents, guidelines)



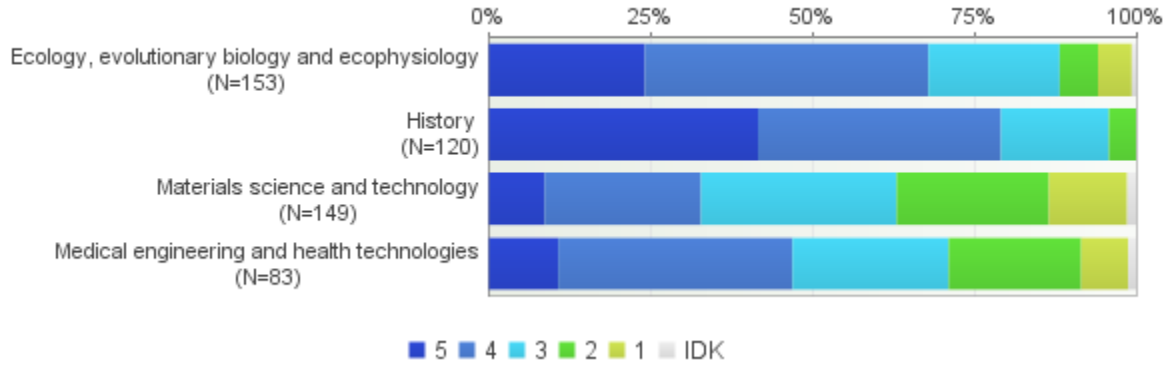
Research information is made openly accessible to the wider use (e.g. opening research data, open access publishing)



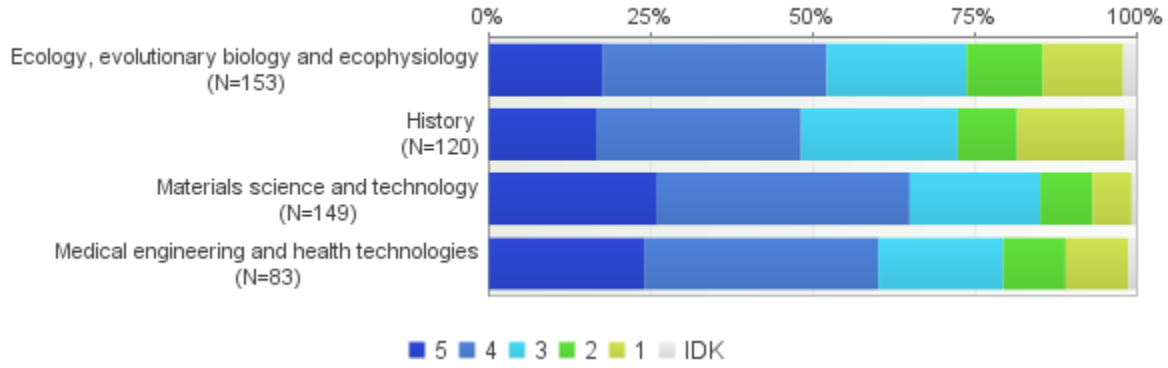
Research is discussed with various stakeholders (e.g. at meetings, workshops)



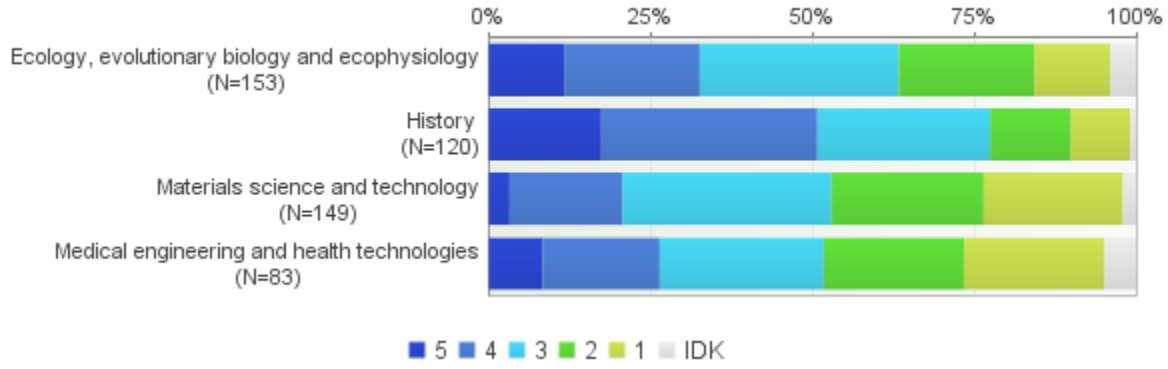
Knowledge is interpreted for a general audience (e.g. via popular articles, exhibitions)



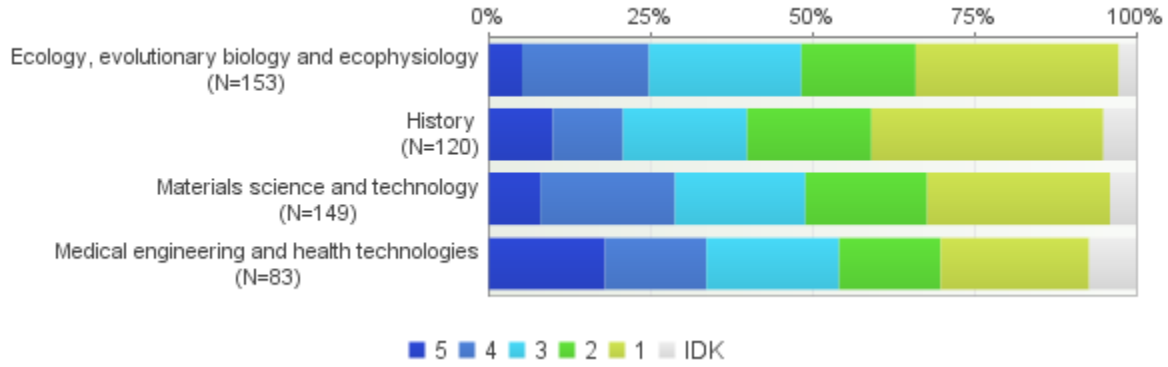
Knowledge walks with skilled people (e.g. expert mobility and training)



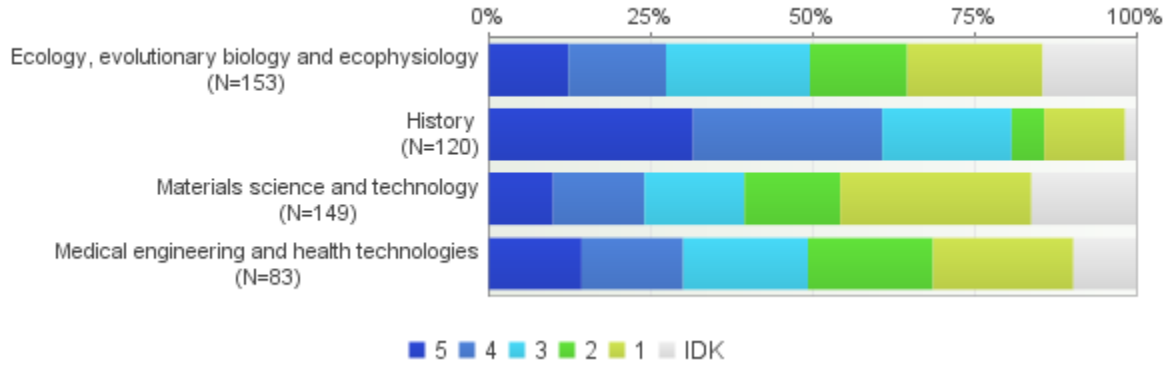
Researchers take action to influence others (e.g. public comments, appearances, lobbying)



Research is done in an interactive process that involves actors beyond academia (e.g. participatory research, co-design)



Acquiring new knowledge is already an intervention (e.g. addressing unquestioned beliefs or silenced issues, running social experiments)



8. To illustrate your selections above, please briefly describe the pathways to impact that are most important to your research.

Number of respondents: 365

9. Please identify one or more of your publications or other outputs that have had an influence beyond academia.

Give the exact title and publication details of the output (or other identifiers) – we may trace its diffusion and use. Give also your own idea of where and how the publication etc. has been influential. The potential impacts of your research will be surveyed more extensively in later questions.

Number of respondents: 288

INTERACTION

It is often argued that research impact emerges through productive interactions. Interaction can be either direct (personal contacts) or indirect (e.g. the media, publications) and it can range from informal encounters to well-established forms of cooperation (e.g. advisory boards). In this section, we survey researchers' various interactions beyond their own scientific community. As different aspects of interaction are covered by separate questions, we recommend taking a look at the whole section (i.e. this page) before answering the questions.

10. What kinds of stakeholders, organisations or actors has your research deliberately interacted with?

Please select all groups with whom you have actively shared knowledge or viewpoints relevant to the research, such as about the framing of research problems or the meaning of research results. (If you have interacted with an actor that represents more than one of the following groups, select a group that best captures the interests of the actor in terms of your research.)

Number of respondents: 468

	Ecology, evolutionary biology and ecophysiology (N=148)	History (N=117)	Materials science and technology (N=138)	Medical engineering and health technologies (N=80)
Academic actors, beyond the scientific community in your field (e.g. other fields of research, other types of organisations) [A]	127	107	127	74
Educational actors, beyond the scientific community in your field (e.g. polytechnics, curricula designers) [B]	42	46	40	20
Industry and commerce (e.g. companies) [C]	51	18	104	62
Public administrative actors (e.g. officials, policy-makers) [D]	85	51	37	21
Civil society actors (e.g. nongovernmental organisations, societies, clubs) [E]	60	76	13	9
Ordinary citizens or the general public (e.g. patients, consumers) [F]	72	88	31	29
Other, please specify [G]	13	16	6	7

11. In what roles have the above stakeholders acted in your research?

If you selected more than one stakeholder group above, please specify the role(s) of each group by entering the letter (A–G) of that group after the selected role(s). One stakeholder group can have several roles.

Number of respondents: 458

	Ecology, evolutionary biology and ecophysiology (N=144)	History (N=115)	Materials science and technology (N=134)	Medical engineering and health technologies (N=80)
As a research partner	115	75	123	68
As an adviser or overseer	41	34	74	40
As a financial supporter	57	30	87	41
As an active follower	83	78	77	49
As an informant, inspirer or assistant	64	71	52	40
As a knowledge user or beneficiary	100	93	81	56
As a mediator or critic	53	67	45	23
In another role	4	6	7	5

12. To illustrate your selections above (questions 10 and 11), please identify some of the most important stakeholders, organisations or actors that your research has interacted with, and tell a few words about the interaction.

Our goal is to understand the patterns of interaction. Case-specific examples will not be reported without the permission of the respondent.

Number of respondents: 319

13. Besides productive interactions, what other actions have you taken for your research to make an impact in society?

Number of respondents: 277

IMPACTS

The questions (14-17) in this section are based on the idea that research has an impact beyond academia when it contributes to developments that are considered valuable in society. Our goal here is to inquire about the contribution of your research to various developments, not about your personal preferences or values (even if they are often interconnected).

14. What are some of the concrete contributions your research has made to developments beyond academia?

Please identify one or more ongoing developments to which your research has made a positive contribution, and briefly explain the importance and nature of your contribution (e.g. what result or viewpoint has made the difference, where, to whom it matters, and how?).

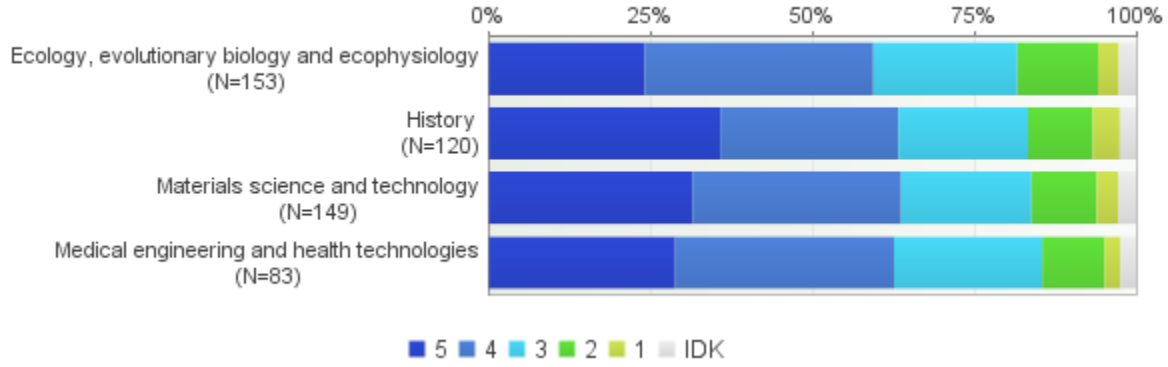
Number of respondents: 287

15. What kinds of factors are likely to hinder the attribution of impact to your research, and/or the potential impacts to realize?

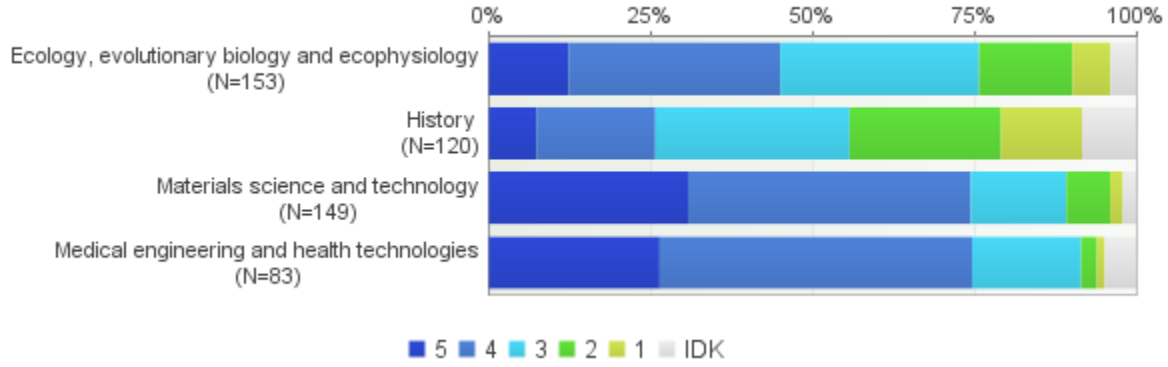
Please assess the validity of the following statements in terms of your research. (5=I strongly agree, 4=I agree, 3=I neither agree nor disagree, 2=I disagree, 1=I strongly disagree, IDK=I don't know)

Number of respondents: 490

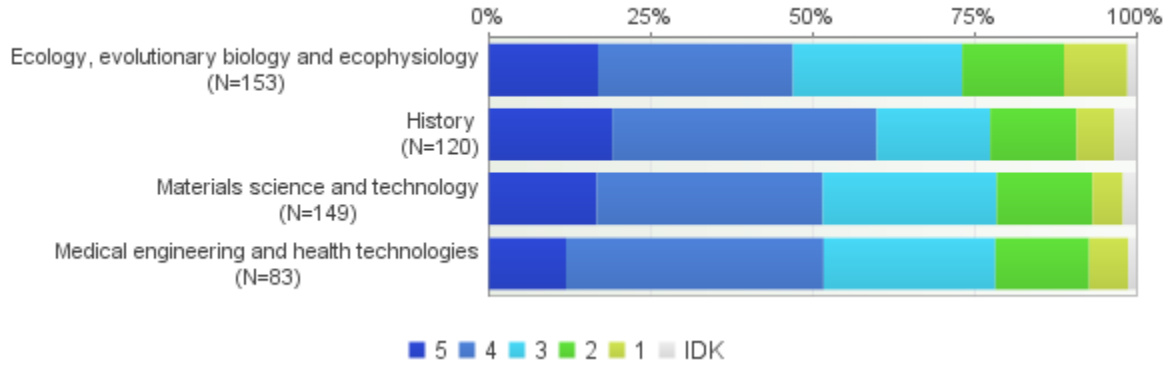
There is a significant time lag between the research and the realization of the impact (more than ten years).



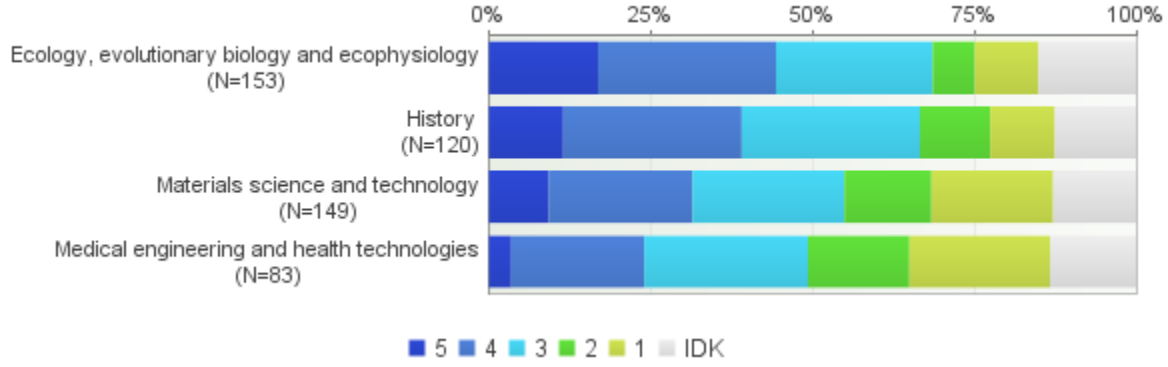
Potential impacts depend a great deal on how the research succeeds (such as in the case of high-risk, high-gain research).



The realization of impacts depends essentially on other people, or on processes over which researchers have very limited influence.



There are clearly different opinions about the potential impacts or their desirability.



16. Please tell a few words about the challenges involved in assessing the impacts of your research.

Number of respondents: 299

17. Where will the potential impacts of your research be seen in the (short or) long run?

Please select all developments to which your research, if successful, can make a contribution. If the categories provided below do not (sufficiently) capture the potential impacts of your research, please type in your own description of the impacts in the open-ended question on the next page (question 18).

Public institutions and services

Number of respondents: 344

	Ecology, evolutionary biology and ecophysiology (N=130)	History (N=95)	Materials science and technology (N=81)	Medical engineering and health technologies (N=49)
Preparation of policy-making, legislation or other regulations	108	59	35	18
Renewal of teaching curricula; educational planning	54	72	34	13
Improvements related to other public services (e.g. public security, transportation, social services)	18	26	26	24
Improved function of public institutions (e.g. tackling problems, open discussion forums)	31	34	5	11
Other impact on public institutions and services, please specify	20	18	12	16

Economy and economic renewal

Number of respondents: 299

	Ecology, evolutionary biology and ecophysiology (N=77)	History (N=38)	Materials science and technology (N=134)	Medical engineering and health technologies (N=64)
Improved business capability or competitiveness of individual companies (e.g. through new or improved products or services)	35	5	108	51
Improved prospects for employment or expert work (e.g. through making experts more attractive for recruitment)	39	19	77	33
New business activity; attraction of investments	23	7	98	45
Development or renewal of the economic environment; adaptive capacity of the economy (e.g. structural diversity, new modi operandi)	26	17	34	11
Other impact on the economy and economic renewal, please specify	16	11	7	3

Health and wellbeing

Number of respondents: 220

	Ecology, evolutionary biology and ecophysiology (N=50)	History (N=44)	Materials science and technology (N=62)	Medical engineering and health technologies (N=78)
Reduced morbidity or illness; improved physical or mental health	21	13	26	47
Reduction of social problems; improved social welfare	9	31	4	11
Improvement of healthcare	10	6	33	57
Management or prevention of health-related risks	31	8	25	50
Other impact on health and wellbeing, please specify	10	11	8	10

The environment and natural resources

Number of respondents: 304

	Ecology, evolutionary biology and ecophysiology (N=145)	History (N=27)	Materials science and technology (N=122)	Medical engineering and health technologies (N=19)
Reduction of environmental stress; improved state of the environment	93	7	94	8
Sustainable use of natural resources; protection of biodiversity	126	11	92	7
Sustainability of the built environment, infrastructures or land use	29	11	25	5
Management or prevention of environmental risks; improved ecological resilience	110	6	33	11
Other impact on the environment and natural resources, please specify	5	7	5	2

Human capacities and culture

Number of respondents: 253

	Ecology, evolutionary biology and ecophysiology (N=68)	History (N=114)	Materials science and technology (N=55)	Medical engineering and health technologies (N=22)
Strengthening of civilization, citizen participation or civil activity	50	97	21	12
Protection of cultural diversity; improved cultural interaction or coexistence	11	90	9	6
Development of environments supporting creativity, experimentation and learning	31	55	30	13
Development of national or international community (e.g. national identity, global justice)	21	95	14	5
Other impact on human capacities and culture, please specify	1	19	9	1

18. Other comments on the broader impacts of your research or on the assessment of research impact more generally.

Feel free to complement any of your answers above.

Number of respondents: 133

19. Would you like to participate in a focus group interview about the broader impacts of research in your field?

A focus group is a semi-structured interview with a selected group of individuals, who are encouraged to share their views with other group members. One focus group will involve 4–10 persons invited from within and beyond academia. The interviews will take place in Helsinki in March/April 2016.

Number of respondents: 490

	Ecology, evolutionary biology and ecophysiology (N=153)	History (N=120)	Materials science and technology (N=149)	Medical engineering and health technologies (N=83)
Yes – I volunteer to be contacted about the interview	18	26	21	12
Possibly – I volunteer to be contacted about the interview	53	39	42	23
No – please do not contact me about the interview	82	55	86	48

20. If you volunteer to participate in the interview, please recommend potential stakeholders to be invited to the same focus group.

If possible, also name a contact person and give his/her contact details. (If you respond to this survey via the public link instead of a personal link emailed to you, please also give your own contact details!)

Number of respondents: 106