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Research integrity in Norway

– results from a nationwide survey on research ethics

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Research integrity in Norway – results from a nationwide survey on research ethics

The first interim report from the working group in the research project RINO (Research Integrity in Norway)

A nationwide survey

Over the last 30–35 years, the focus on scientific honesty and research integrity has been increasing. In Norway, this has led to a statutory requirement for the establishment of dedicated national and local bodies aimed at preventing and processing cases of suspected scientific misconduct. The last survey to be conducted on attitudes to and experiences with falsification, fabrication and plagiarism (herein referred to as FFP) and questionable research practices (herein referred to as QRPs) dates all the way back to 1996. The time was therefore ripe for a new and more comprehensive survey to map the current situation.

Here we present the preliminary findings from a nationwide survey on research integrity in Norway. The survey consisted of a questionnaire that was e-mailed to 31 206 researchers in Norway. Of these, 7 291 completed the entire questionnaire, corresponding to a response rate of 23.4%.

Summary

The main findings in the report can be summarised as follows:

- We find a high degree of normative consensus in relation to FFP issues. The clear majority consider such practices to be very problematic.
- The more serious a practice is considered to be, the less common it is for researchers to have either observed colleagues engaging in such practices or for researchers to have engaged in it themselves.
- There is also a normative consensus with regard to QRPs, with a few exceptions, but not to the same extent as for FFP. A higher proportion consider QRPs to be somewhat problematic or not problematic at all.

- A ranking based on the mean assessed severity shows a clear hierarchy, where falsification, fabrication and plagiarism are considered to be the most serious practices, and strategic citation and strategically breaking up results into different publications (salami slicing) to be the least serious.
- A comparison shows some disparities between the disciplines, but these are not extensive. The variation within the disciplines is clearly greater than the variation between the disciplines.
- A majority report having received no training in research ethics, or only one day of training or less. Additionally, only a very small minority report that they have no knowledge of research ethics guidelines or the principles for rightful authorship.
- There is relatively little knowledge on what procedures to be followed when reporting suspected research misconduct.

Background

Our global community is facing major challenges that can only be solved if we ensure good living standards, democratic decision-making structures and the fair distribution of goods for all, also for future generations. At the same time, digitisation in many areas of society and employment, such as smart transport systems, robots, the Internet of Things and Big Data on a whole new scale, represents both opportunities and challenges for the years ahead. There is broad agreement that Norway, like other countries, is reliant on scientific research helping to solve these challenges. Without research, both the analysis and the recognition of common solutions will fail.

Meanwhile, some researchers suggest that scientific research seems less and less prepared for delivering the quality that is expected (Benessia et al., 2016). In a European context, new framework conditions for research have been introduced to address this, such as the Responsible Research and Innovation (RRI) framework,[1] and the recent Open Science initiative.[2] There is also growing acknowledgment that all research can be weakened if there is reason to doubt its fundamental integrity at all stages.

The first sign that something may have been amiss with regard to scientific honesty, emerged in the United States at the start of the 1980s (Broad & Wade, 1982), with Congress hearings followed by widespread public interest. The so-called Baltimore/Imanishi-Kari case (Kevles, 2000) led to fundamental discussions about how, in the most dramatic cases of cheating, adequate protection can be given to whistle-blowers and to the parties suspected of dishonesty, who in some cases may be unjustly accused. This turned the focus to institutional measures and mechanisms for dealing with research misconduct.

[1] See for example: https://www.rri-tools.eu/
[2] https://ec.europa.eu/research/openscience/index.cfm

Empirical studies have shown that the situation is not fundamentally different in other countries. The prevalence of both FFP and QRPs is generally of the same magnitude across national borders and disciplines (for example Fanelli, 2009).

In Norway, the National Research Ethics Committees (NEM, NESH, NENT) were established in 1990, with a remit that included preventing research misconduct. In 2007, the National Commission for the Investigation of Research Misconduct was established. In the 1990s, misconduct in medical research came under the spotlight (for example Nylenna et al., 1999), but otherwise there was little awareness or suspicion that misconduct was a major problem in research in Norway. In the period 1996–97, NENT and NESH carried out a joint investigation into whether fraudulent research might also be a problem in Norway, and particularly in disciplines that until that point had received little attention, such as the social sciences and natural sciences (Elgesem, Jåsund & Kaiser, 1997). This resulted in a national survey sent to researchers within selected disciplines and universities. There was no electronic media technology at this point, so surveys of this type were carried out via regular post, which respondents also used to submit their completed questionnaires.

The findings suggested that the situation in Norway was about the same as in other countries. The survey even showed a proportion of self-reported cases of FFP, which had never been seen in previous surveys.[3]

Since then, more Norwegian studies have been conducted, but these are restricted to the medical research and education communities (for example Hofmann, Myhr & Holm, 2013).

Definitions

Norway introduced research ethics legislation in 2006. An outline of the legislation was drawn up earlier in the wake of a study on research misconduct at Norwegian universities (*Fusk i forskning*) (Elgesem et al., 1997) and Report No. 39 to the Storting (1998-99) – *Forskning ved et tidsskille*, but it was finally adopted after being brought into focus by a widely reported misconduct case in which it was discovered that cancer researcher Jon Sudbø had fabricated research data. In 2017, the Act concerning the organisation of work on ethics and integrity in research (Research Ethics Act) was introduced. The Act gives the following definition of scientific misconduct:

‘Scientific misconduct is defined as falsification, fabrication, plagiarism and other serious breaches of recognised research ethics norms that are committed intentionally or through gross negligence in the planning, conducting or reporting of research.’ (§8, LOV-2017-04-28-23).

There is no uniform internationally recognised definition of scientific misconduct, but there is broad agreement that falsification, fabrication and plagiarism (FFP) are core elements. From a research ethics perspective, integrity entails maintaining and adhering to good scientific practices. Integrity is normally associated with the quality of research and the search for the truth (Kaiser, 2014; De nasjonale forskningsetiske komiteene, 2016).

[3] The report was also criticised due to what was considered at the time to be a low response rate (38.7%; N = 456) and to the limited sample (1 203 academic staff). It was further claimed that it gave a rather negative impression of Norwegian research at a time when research needed more public support.

The Norwegian legal definition is now broader than it was originally; misconduct can now apply to all (serious) breaches of research ethics norms. At the same time, the new Research Ethics Act places greater responsibility on research institutions having in place systems and bodies to prevent and process their own integrity cases. This also entails a tendency to view integrity in the context of a complete research system, where the FFP phenomenon is at the most extreme end of a scale.

Viewing integrity in a larger context in research is in line with international developments, where terms such as 'research integrity' are now commonly in use (see ALLEA, 2017).[4] We therefore use this term in the RINO survey, primarily applying it to the norms for good scientific practice and norms that regulate the relationship between researchers.

Research integrity is defined for these purposes as follows: 1) the research is based on the recognition of fundamental ethical norms such as reliability, truthfulness, respect and accountability; 2) the research follows recognised research ethics regulations and laws; 3) competent use of verifiable and most reproducible methods, and 4) good interplay with quality control mechanisms in research.

All forms of FFP (falsification, fabrication, plagiarism) and QRPs (questionable research practices) are thus regarded as unacceptable. Research integrity aims at high-quality results as an overarching ideal, a high degree of regulatory compliance in the research process, and a high degree of accountability among researchers.

Since 2007, five World Conferences on Research Integrity have been held. Globally, the focus has shifted from investigating the prevalence of FFP to more systemic studies of integrity. Various guidelines on research ethics have also been drawn up (Singapore Statement, 2010; ALLEA, 2017). QRPs are playing an increasingly central role in the discussion, partly because empirical studies have shown that the prevalence of QRPs is far greater than the prevalence of FFP. In a meta-analysis based on 21 studies, Fanelli (2009) found that up to 2% of the researchers who responded admitted to FF, and up to one-third admitted to QRPs. In this survey, questionable research practices include allocating co-authorship on false premises, using data selectively and concealing conflicts of interest. Based on qualitative experiences in integrity committees/ethics committees, QRPs appears to be a dominant problem in an institutional context and in preventive work.

[4] For alternative definitions of scientific integrity, see for example Steneck, 2006, pp. 55-57 and Shaw, 2018.

The RINO project

The RINO project was initiated as a result of reactions to and discussions about the follow-up of the new Research Ethics Act. The Committee for Academic Integrity at the University of Bergen (UiB) and the Integrity Committee at the Western Norway University of Applied Sciences (HVL) agreed with the Norwegian National Research Ethics Committees (FEK) to conduct a national interdisciplinary project entitled Research Integrity in Norway – RINO. The aim of the project is threefold: to map the scope of – and attitudes to – research misconduct (FFP) and questionable (QRPs) research; 2. to gain insight into researchers' knowledge about and attitudes to research integrity; and 3. to map possible conditions that contribute to misconduct and propose factors that help to promote research integrity.

A steering group, working group and reference group were appointed for the RINO project (see Appendix 1 with excerpts from the project description[5]). The project was granted approval by the Norwegian Centre for Research Data (NSD) for processing personal data. The personal data has been deleted in accordance with the agreement, and it is not possible to identify individuals from the results. The working group complies with national and international guidelines on rightful authorship and has devised detailed guidelines on authorship in the RINO project.

A key element of the RINO project is that it consists of several interconnected processes. An initial scientific literature review was followed by a quantitative study in the form of a questionnaire. This quantitative part of the project will provide a basis for a qualitative follow-up, with interviews and focus groups. Thus, the choice of questions in the quantitative survey was also geared towards the more overarching research questions in RINO. Another limitation was that e-mail surveys should not take more than 15 minutes to complete, otherwise there is a risk of losing many potential participants.

The design and execution of the survey

The working group designed the questionnaire based on similar national and international surveys (for example Elgesem et al., 1997; Anderson, 1996, Martinson, Anderson & De Vries 2005; Fanelli, 2009). These were partly translated and partly adapted to the Norwegian situation. The questionnaire also included an open comments field. Prior to sending out the questionnaire, a quality control check was performed through discussion in the working group and testing in a pilot study.

The sample was compiled from publicly available e-mail lists at Norwegian universities, university colleges and research institutes. The overview of the institutions was taken from the Nordic Institute for Studies in Innovation, Research and Education (NIFU) and includes the entire population. We cannot assert with 100% certainty that we have had access to all the e-mail addresses of all institutions. There may therefore be a few potential sources of error, such as double registration of researchers with more than one workplace, or underrepresentation where a researcher is not included on the institution's e-mail list. A very small number of institutions are not represented at all.

The questionnaire was e-mailed to 31 206 staff at the aforementioned types of institution. The first batch was sent on Friday, 19 January 2018. Two reminders were sent to every e-mail address, which

[5] https://www.uib.no/sites/w3.uib.no/files/attachments/rino_research_integrity_in_norway_project_description_f_0.pdf

included a link to the questionnaire; the first reminder was sent a week after the first mailing and the second was sent after three weeks. Wednesday 1 March was set as the final date for the data collection, i.e. a timeframe of almost seven weeks. At this point, a total of 7 947 researchers had responded to all or parts of the survey, which corresponds to a response rate of 25.5%. The number that completed the entire questionnaire was 7 291 – i.e. a response rate of 23.4%. The number of respondents was far more than other corresponding international surveys on research ethics practices. One exception is a new study of research ethics within publishing practices, which analysed over 12 000 responses from more than 110 000 respondents (Fong & Wilhite, 2017).

The response rate for our survey may seem low, but it has to be viewed in light of the marked rise in non-response rates over the past 20 years. In the literature on the recruitment of web-based panels, response rates vary from 6.7% to 14.5%, depending on how the survey is conducted (Rao, Kaminska & McCutcheon, 2010). The working group therefore considers the response rate for the RINO survey to be acceptable. By comparison, the Norwegian Citizen Panel has experienced lower response rates in all three of its three rounds of panel recruitment, despite rewarding respondents and having more frequent contact with them (Høgestøl & Skjervheim, 2013).

In the analyses that follow, we only use the respondents who completed the entire survey.[6] Some of the individual analyses also exclude respondents whose responses to all questions are identical in one or more batteries of questions. We consider these to be unusable questionnaires that reduce the overall quality of the data. However, this only applies to a very small number of respondents (less than 30 out of 7 291). As expected, this had little impact on the marginal distribution (Greszki, Meyer & Schoen, 2015).

Sample bias

The distribution in the RINO sample from 2018 is comparable with the distribution of the publicly available NIFU database for 2016 as regards four key variables: gender, job category, discipline and age.

The gender distribution in the RINO survey and in the NIFU database are identical: 48% women and 52% men. Broken down into the various job categories, some biases emerge. In the RINO sample, the percentage of female professors is somewhat higher, and the proportion of female associate professors is somewhat lower than in the population. Since no systematic gender overrepresentation or underrepresentation was found for the job categories as a whole, the working group believes that the weak biases that do exist do not warrant weighting the sample based on gender and position.

For the job categories in isolation, there is a clear tendency for the purely research positions and positions where a share of the post is allocated to research (e.g. professor and associate professor) to be overrepresented and for positions with little or no time allocated to research (e.g. lecturers and senior lecturers) to be correspondingly underrepresented. Given the topic of the study – research integrity – this result was to be expected. The survey could be regarded as more relevant to respondents who are active researchers than to respondents whose posts mostly entail lecturing. Consequently, the biased distribution can also be interpreted as a result of self-selection.

[6] Respondents who answered the survey after the first reminder did not necessarily respond to all of the questions in the survey. After the first reminder was sent, it was possible to skip some questions, but still complete the survey. This disparity may constitute a source of error but does not appear to have affected the response distributions.

In terms of disciplines, mathematics/natural sciences are overrepresented by 4.6%, while social sciences are underrepresented by 6.3% and medicine by 3.6% in the sample as a whole. However, among *university staff*, medicine is overrepresented by 6%. The greatest disparity is in the university college component of the sample, where social sciences is more strongly underrepresented and the humanities is correspondingly overrepresented. Our figures include both state university colleges and specialised university institutions. In the NIFU database, there are some considerable disparities between these two types of institution.

Finally, the response rate is somewhat higher among older than younger respondents. However, the disparity between the population and the distribution in the university component of the sample is minimal.

In the university college component of the sample, both the youngest and the oldest associate professors are somewhat underrepresented. The same pattern is found for some other job categories, but not all.

Based on an overall assessment, the working group determined that weighting for age can create new biases. Therefore, in the analyses that follow, the results presented are all unweighted.

Individual results

A range of research ethics guidelines have been developed both nationally and internationally. Internationally, the so-called Vancouver recommendations (Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals) are widely applied as principles for rightful authorship, particularly in medicine and health studies, but they also represent a framework within other disciplines. These also form the basis for national guidelines, although there are some disparities between the disciplines, and general, subject-specific and topic-specific research ethics guidelines have been developed (www.etikkom.no).

In a European context, the recently revised guidelines from European science academies have taken centre stage (ALLEA, 2017).

The national Guidelines for Research Ethics in the Social Sciences, Humanities, Law and Theology were drawn up in 1993, while the Guidelines for Research Ethics in Science and Technology were first introduced in 2007. These guidelines aim to express recognised research ethics norms, thus covering a wide spectrum of research ethics issues. Research ethics guidelines do not function in the same way as statutory imposed practices – they are intended to serve as guide. The guidelines are therefore of an advisory nature. Meanwhile, universities and university colleges have a statutory responsibility to ensure that research and academic and artistic development work maintains a high standard 'and is conducted in accordance with recognised scientific, artistic, pedagogical and ethical principles' (Universitets- og høyskoleloven, § 1-5). The Act concerning the organisation of work on ethics and integrity in research (Research Ethics Act) from 2017 states that research institutions must ensure that everyone who conducts or participates in research is familiar with research ethics norms (Section 5). In other words, the institutions now have a statutory responsibility to safeguard knowledge on research ethics guidelines.

In practice, research ethics guidelines have been incorporated into organised research training at most universities in Norway, and such guidelines should therefore be known, at least to the younger generation of researchers. The Act also implies individual responsibility and states that researchers should act with care to ensure that all research is conducted in accordance with recognised research ethics norms (Section 4).

Table 1 summarises the findings on knowledge of research ethics guidelines, the principles for rightful authorship, and the procedures for reporting suspected research misconduct.

Table 1: Knowledge of research ethics guidelines, the principles for rightful authorship, and the procedures for reporting suspected research misconduct

	Are you familiar with research ethical guidelines (Norwegian or international) within your field of expertise?	Do you know the principles for rightful authorship in scientific publications?	If you needed to report a case of suspected research misconduct, would you know what procedures to follow?
I have no knowledge of this	3,2 %	2,9 %	40,5 %

I have some knowledge of this	47,6 %	37,9 %	51,5 %
I am well informed on this matter	49,2 %	59,2 %	8,0 %
Total	100 % (N=7252)	100 % (N=7241)	100 % (N=7259)

Only a very small minority report that they have no knowledge of research ethics guidelines and the principles for rightful authorship: 3.2% and 2.9% respectively. The relatively high percentage who say they are well informed about the principles for rightful authorship – 59% – is also as expected.

The Research Ethics Act (2017) also imposed a statutory responsibility on institutions to establish procedures ('guidelines') for dealing with cases of suspected breaches of recognised research ethics norms (Section 6). This includes dealing with suspected research misconduct. The lack of knowledge regarding which procedures to follow when reporting suspected research misconduct is alarming. A total of 40.5% of respondents state that they have no knowledge of such procedures, and only 8% believe that are well informed about this matter. This represents a risk of underreporting cases of research misconduct.

Research ethics training

As already mentioned, the institutions have a statutory responsibility to train staff in research ethics. This responsibility can be met in a variety of ways, such as online courses, clear information about norms, laws and regulations on the institution's websites, at seminars and workshops, in debates, and credit-bearing courses at all levels, such as in the research training.

The responses from the survey indicate that this responsibility is probably not well met. As many as 36.8% of the respondents have never received such training and 23.7% have only received one day of training or less.

Table 2: Have you participated in any course on research ethics?

No, never	36,8 %
Yes, a course lasting one day or less	23,7 %
Yes, a course lasting more than one day	23,3 %
Yes, several courses (either short or long)	16,2 %
Total	100 %

Authorship and 'salami slicing'

Principles for rightful authorship are central to both international and national guidelines and concern respect for the contributions of others and responsibility for the scientific work. For the vast majority of researchers, scientific publications will be vital to their career in terms of applications for promotion, applications for research funding and sabbaticals, and for job applications. At the same time, multi-authorship has become more common in several fields of expertise.

A multitude of situations can therefore arise where research ethics norms are challenged. Being denied or denying someone else of co-authorship despite making a significant contribution to a scientific work may eventually have direct personal consequences for the person concerned. Not surprisingly, the vast majority regard this practice as unacceptable.

Table 3: Attitudes towards questionable or unacceptable practices. 'Gift authorship', denying authorship despite significant contribution to a scientific work and 'salami slicing'

	To accept, mandate or allocate authorship based on criteria other than significant contribution to a scientific work (gift authorship)	To deny or omit authorship despite significant contribution to a scientific work	To break up or segment study results into two or more publications to boost your publication credits, at the expense of scientific quality (salami slicing)
This is not problematic at all	1.7 %	1,6 %	4,3 %
This is somewhat problematic	12,4 %	3,7 %	31,3 %
This is quite problematic	34,1 %	14,6 %	43,4 %
This is very problematic	51,7 %	80,1 %	21,0 %
Total	100 % (N=7240)	100 % (N=7243)	100 % (N=7226)

A total of 8 out of 10 respondents consider this to be very problematic. With only 5% of respondents finding this not problematic at all or somewhat problematic, this further highlights the prevailing normative consensus.

For the other two practices related to publication in Table 3; gift authorship and salami slicing (see the table for definitions of the terms), the variation is much greater. Although there is still a clear majority who believe these practices are problematic, the proportion that considers this to be a minor breach is relatively large. For example, 14% of respondents regard allocating a gift authorship as something less serious, and only 1 in 5 or 21% consider salami slicing to be very problematic. The researchers are clearly divided in their view on the severity of salami slicing. This may be linked to the uncertainty surrounding whether there are any injured parties in such practices, which is also the case with, for

example, gift authorship. Several respondents point out in the comments field that salami slicing can be an ambiguous term, and that not all forms of salami slicing necessarily constitute a research ethics problem.

Views on breaches of good research ethics will partly depend on the degree of propagation of a given practice. If salami slicing and gift authorships are relatively common, it may be assumed that a large proportion of researchers do not consider these practices to be particularly problematic. The survey therefore poses the following questions:

- Do you know whether colleagues have engaged in this type of practice in the last three years?
- Have you yourself engaged in this type of practice in the last three years?

The results can be considered to be clear. Far more researchers know of cases of gift authorship (29.5%) and salami slicing (27%) than of anyone being denied rightful authorship (13%). Additionally, even though the vast majority state that they have not engaged in any of these practices themselves in the last three years (Table 5), as many as 11.3%, or 1 in 9, say that they have participated in allocating a gift authorship. A total of 8.4%, or 1 in 12, have produced publications using the salami slicing method. Only 1.8%, or slightly less than 1 in 50, say they have denied anyone authorship despite the person in question making a significant contribution.

As regards awareness of colleagues' publications practices (Table 4), it is reasonable to assume that it is not easy to gain an insight into other people's possible breaches of good research ethics.

Table 4: Knowledge of colleagues' questionable or unacceptable practices. 'Gift authorship', denying authorship despite significant contribution to a scientific work and 'salami slicing'

	Do you know whether colleagues at your department/unit (department, section, center, etc.) have engaged in this type of practice in the last three years?		
	To accept, mandate or allocate authorship based on criteria other than significant contribution to a scientific work (gift authorship)	To deny or omit authorship despite significant contribution to a scientific work	To break up or segment study results into two or more publications to boost your publication credits, at the expense of scientific quality (salami slicing)
No	70,5 %	87,0 %	73,0 %
Yes, I know about one incident	7,5 %	7,5 %	5,1 %
Yes, I know about a few incidents	18,4 %	5,0 %	17,0 %
Yes, I know about several incidents	3,6 %	0,5 %	4,9 %
Total	100 %	100 %	100 %

	(N=7073)	(N=7159)	(N=7091)

The next table concerns self-reporting. A certain proportion reports having been involved in allocating gift authorships; something that is to be expected since this practice is perceived as less serious (Table 3).

Similarly, we also find some who report salami slicing. Given that the level of acceptance for both publication practices is quite high, and that differences in subjective judgements can determine whether these practices are considered acceptable or not, there is reason to assume a degree of underreporting.

Table 5: Have you yourself engaged in questionable or unacceptable practices? 'Gift authorship', denying authorship despite significant contribution to a scientific work and 'salami slicing'

	Have you yourself engaged in this type of practice in the last three years?		
	To accept, mandate or allocate authorship based on criteria other than significant contribution to a scientific work (gift authorship)	To deny or omit authorship despite significant contribution to a scientific work	To break up or segment study results into two or more publications to boost your publication credits, at the expense of scientific quality (salami slicing)
No	88,7 %	98,2 %	91,6 %
Yes, once	5,9 %	1,3 %	4,1 %
Yes, a few times	4,7 %	0,5 %	4,1 %
Yes, several times	0,4 %	0,04 %	0,2 %
Total	100 % (N=7116)	100 % (N=7123)	100 % (N=7111)

In summary, the results show that the practices that are perceived as least serious are also those that are most common. Meanwhile, only a small minority report having carried out or been involved in the publication practices covered in the survey.

Fabrication and falsification of data/material. Plagiarism.

In the history of science, there are various well-known and notorious examples of data being fabricated or falsified (see for example, Broad & Wade 1982). Among the most known are 'The Piltdown Man', where fake fossils were 'planted' in a gravel pit in Sussex in 1912, the exposure of the world-renowned psychologist Sir Cyril Burt's fabrication and falsification of data about twins, and in the Norwegian context, the previously mentioned Sudbø case. Internationally, the Alsabti case is a well-known example of particularly serious plagiarism, where more than 50 scientific papers were found to be pure plagiarism. Hwang Woo Su, a Korean, fabricated research into the cloning of human embryonic cells.

The most fervently discussed case in recent times is perhaps that of the Dutch psychologist Diederik Stapel, where more than 55 scientific papers had to be retracted as they were based on falsified or manipulated data. The case raised a barrage of criticism about the flawed quality control and poor practices in the research community.

Fabrication, falsification and plagiarism are nationally and internationally considered to be serious breaches of good scientific practice. The RINO survey indicates a general consensus on this. As we see from Table 6, most respondents reported that fabrication, falsification and plagiarism are very problematic.

Although a relatively high (8.4%) proportion of respondents believe that plagiarism is merely 'quite problematic', the data leaves little or no room for doubt: researchers at Norwegian universities, university colleges and research institutes consider such practices to be very serious breaches of applicable ethical norms and guidelines:

Table 6: Views on questionable and unacceptable practices. Fabrication, falsification and plagiarism.

	To fabricate (invent) data/material	To falsify data/material	To present other people's work (ideas, material, text) as your own by excluding a reference to the original source (plagiarism)
This is not problematic at all	0,9 %	0,9 %	0,7 %
This is somewhat problematic	0,6 %	0,4 %	0,8 %
This is quite problematic	1,2 %	0,7 %	8,4 %
This is very problematic	97,3 %	97,9 %	90,1 %
Total	100 % (N=7241)	100 % (N=7239)	100 % (N=7246)

The proportion of respondents who do not consider fabricating data to be problematic at all is potentially even lower than that shown by the figures in the survey. Some comments may indicate that some respondents misunderstood the term: four commented that synthetic, 'fabricated' data does not constitute a research ethics problem. Such computer-generated random data can for example be used to test different analytical techniques and statistical software, but this data does not elucidate a particular empirical phenomenon.

Pursuant to the Research Ethics Act of 2017, all institutions whose main remit entails research are required to deal with cases of 'suspected breaches of recognised research ethics norms'. There is no overarching overview of which cases are dealt with by the institutions, but the National Commission for the Investigation of Research Misconduct is aware, both through their own dealings and from information received from the institutions, that many of these cases have concerned plagiarism (Vinther, 2016). The RINO survey shows that, of the three mentioned practices, knowledge of colleagues' plagiarism is far more widespread than knowledge of colleagues fabricating or falsifying data.

Table 7: Knowledge of colleagues' questionable or unacceptable practices. Fabricated data, falsification, plagiarism.

	Do you know whether colleagues at your department/unit (department, section, center, etc.) have engaged in this type of practice in the last three years?		
	To fabricate (invent) data/material	To falsify data/material	To present other people's work (ideas, material, text) as your own by excluding a reference to the original source (plagiarism)
No	97,8 %	97,8 %	86,2 %
Yes, I know about one incident	1,6 %	1,6 %	7,4 %
Yes, I know about a few incidents	0,5 %	0,5 %	5,8 %
Yes, I know about several incidents	0,1 %	0,1 %	0,6 %
Total	100 % (N=7149)	100 % (N=7149)	100 % (N=7193)

Almost 14%, or around 1 in 7 respondents, state that they are aware of colleagues plagiarising others' work in the last three years. The corresponding figure for fabricating or falsifying data is just 2%, or 1 in 50.

The proportion of respondents that report having engaged in such practices themselves is minimal, from 0.2–0.5%. Fanelli's meta-analysis (2009) finds almost 2% self-reported cases of fabrication and falsification. This is a marked difference from our survey, which indicates a much smaller percentage.

Table 8: Have themselves engaged in questionable or unacceptable practices. Fabricating data, falsification and plagiarism.

	Have you yourself engaged in this type of practice in the last three years?		
	To fabricate (invent) data/material*	To falsify data/material**	To present other people's work (ideas, material, text) as your own by excluding a reference to the original source (plagiarism)***
No	99,8 %	99,7 %	99,5 %
Yes, once	0,07 %	0,2 %	0,3 %
Yes, a few times	0,04 %	0,1 %	0,2 %
Yes, several times	0,06 %	0 %	0,01 %
Total	100 % (N=7129)	100 % (N=7127)	100 % (N=7181)

*A total of 12 respondents report having fabricated data on at least one occasion.

**A total of 19 respondents report having falsified data/material on at least one occasion.

***A total of 35 respondents report having plagiarised a work on at least one occasion.

For the same reasons as above, the number that has fabricated data is probably even lower than indicated in the breakdown in Table 8.

Citations, contested ownership of data and absence of information on limitations

The three following practices represent less clear breaches of research ethics norms.

While we have seen that plagiarism is generally perceived as a very serious breach, copying someone else's citations is not commonly regarded as equally serious. Copying citations represents a breach of one or more principles for citations and handling of sources, such as the requirement to directly consult sources that are referenced or the exhortation to use primary sources. A number of case studies have shown how errors and false information have been able to circulate in academic publications for decades as a result of widespread copying of citations.

It is worth noting, however, that the formulation used in the question pertaining to the use of other authors' citations without direct consultation of the sources avoids any indication that this could be regarded as a form of plagiarism. If this term had been used, the response might have been different, since the majority consider plagiarism to be more serious. Only 30% believes that it is very problematic to copy citations, while 90% have the same attitude to plagiarism.

The requirement for clarifying and adhering to good practices for data ownership and data sharing ensues from the principles of research ethics associated with collegiality (see for example the General Guidelines for Research Ethics from the Norwegian National Research Ethics Committees[7]).

In recent years, a number of individual cases have concerned the unlawful use of data. For example, in two different cases the University of Bergen was fined a total of NOK 600 000. In one of these cases a researcher had used more than 11 000 health data records that had been erroneously supplied to him. In the ensuing discussion, a number of researchers emphasised the truth value of the study rather than the rightful ownership of the data. This illustrates how rightful use of data remains a contentious issue in the research community.

Issues pertaining to ownership may include a variety of elements, and a clear majority of the respondents are of the opinion that these issues are serious. Only 13.5% state that it is not problematic at all or only somewhat problematic to use data whose ownership is contested.

Informing decision-makers and other users about limitations and uncertainties in research is related to the researcher's endeavour to seek objectivity and social responsibility (NENT, 2016). A large proportion is of the opinion that it is quite or very problematic to refrain from providing information about weaknesses in research work. When comparing practices, we see that refraining from providing information on weaknesses in research work is deemed to constitute a more serious breach of good research practice than using data with contested ownership.

Table 9: Views on questionable or unacceptable practices. Copying citations, using data whose ownership is contested, refraining from providing information on important limitations.

	To create the impression of having consulted a source by copying others' citations	To use research data/material when its ownership is contested	To refrain from informing end-users and decision-makers about significant limitations and/or uncertainties in the data material, analysis and/or conclusion
This is not problematic at all	1,2 %	1,6 %	0,8 %
This is somewhat problematic	21,0 %	11,9 %	5,0 %
This is quite problematic	47,1 %	42,1 %	31,6 %
This is very problematic	30,7 %	44,5 %	62,6 %
Total	100 % (N=7236)	100 % (N=7181)	100 % (N=7266)

[7] https://www.etikkom.no/forskningsetiske-retningslinjer/Generelle-forskningsetiske-retningslinjer/

As regards personal experience with these issues, the same pattern emerges as for the variables we reviewed earlier. The less serious an issue is perceived to be, the larger the proportion of respondents who are either aware of colleagues that have participated in the practice in question or who report having committed such acts themselves within the last three years.

The percentage that is aware of colleagues having copied source references on one or more occasions is as high as 25.2%, despite the fact that this practice is difficult to reveal. More than 20% of the respondents report to have done this themselves.

Table 10: Knowledge of colleagues' questionable or unacceptable practices. Copying citations, using data whose ownership is contested, refraining from providing information on important limitations.

	Do you know whether colleagues at your department/unit (department, section, center, etc.) have engaged in this type of practice in the last three years?		
	To create the impression of having consulted a source by copying others' citations	To use research data/material when its ownership is contested	To refrain from informing end-users and decision-makers about significant limitations and/or uncertainties in the data material, analysis and/or conclusion
No	74,8 %	92,2 %	89,1 %
Yes, I know about one incident	4,0 %	4,8 %	3,0 %
Yes, I know about a few incidents	17,1 %	2,8 %	6,7 %
Yes, I know about several incidents	4,1 %	0,2 %	1,2 %
Total	100 % (N=7154)	100 % (N=6875)	100 % (N=6983)

Table 11: Have themselves engaged in questionable or unacceptable practices. Copying citations, using data whose ownership is contested, refraining from providing information on important limitations.

	Have you yourself engaged in this type of practice in the last three years?		
	To create the impression of having consulted a source by copying others' citations	To use research data/material when its ownership is contested	To refrain from informing end-users and decision-makers about significant limitations and/or uncertainties in the data material, analysis and/or conclusion
No	79,3 %	98,9 %	97,5 %
Yes, once	6,4 %	0,8 %	1,2 %
Yes, a few times	13,7 %	0,3 %	1,2 %
Yes, several times	0,6 %	0,04 %	0,1 %
Total	100 % (N=7154)	100 % (N=6983)	100 % (N=6953)

Only 1.1% and 2.5% respond affirmatively when asked whether they had engaged in the two other practices. It is worth noting, however, that the percentage that is aware of colleagues having made use of data with contested ownership is markedly higher (7.8%), and 1 out of 11 believe colleagues have failed to provide sufficient information about the limitations of a study.

Change designs/methodologies in response to pressure, refrain from reporting breaches, irrelevant references

The increasing attention paid to rankings and citation indices has also raised the awareness of citation frequencies, both for individual researchers and research groups. In the questionnaire, the respondents were asked to assess a statement on deliberate citation to increase the citation frequency of a colleague, a research institution or a journal. The results indicate that this practice is to a lesser extent perceived as a serious breach of good research practices. While 21% perceive 'salami slicing' as very problematic (Table 4), 25.9% think the same about a goal-oriented attitude towards citations:

Table 12: Views on questionable or unacceptable practices. Change a study in response to pressure, refrain from reporting breaches, include irrelevant references.

	To change the design, methodology and/or results of a study in response to pressure from stakeholders or funding sources	To refrain from reporting (whistle blowing) serious breaches of research ethical guidelines	To include irrelevant or unnecessary references in a publication in order to increase the citation frequency of a colleague, a research environment or a journal
This is not problematic at all	1,1 %	1,2 %	2,0 %
This is somewhat problematic	5,3 %	5,2 %	26,7 %
This is quite problematic	22,5 %	30,5 %	45,4 %
This is very problematic	71,1 %	63,1 %	25,9 %
Total	100 % (N=7223)	100 % (N=7224)	100 % (N=7228)

Although a clear majority think that such use of citations is quite or very problematic, nearly 1 out of 3 nevertheless believe this is not problematic at all or only somewhat problematic. In other words, we find a pronounced disagreement within the sample regarding the degree of seriousness of this practice.

As regards the two other practices, we find a clear normative consensus, although the degree of seriousness is not deemed as high as in the case of the FFP practices. The proportion that perceives these as only somewhat problematic or completely unproblematic amounts to no more than 6.5%.

Yet again we find a pattern where experience of the practices in question is inversely proportional to the perceived degree of seriousness. Only a very small minority reports having participated in the last three years in practices that are generally considered to be unethical. With regard to the use of irrelevant references, the situation is somewhat different. A total of 12.5%, or 1 in every 8 respondents, report having done this on one or more occasions in the last three years, and a little more than 1 in 5 are aware of colleagues who have done the same.

Changing designs, methodologies or results in response to pressure from stakeholders or refraining from reporting (‘whistleblowing’) serious breaches of the guidelines appear to be far

less common. A little more than 4% report to have engaged in either of these practices, and the percentages that are aware of colleagues who have done so amount to 10.5% and 7% for each practice respectively. The latter figures indicate that experience with such practices is approximately at the same level as for unlawful use of data and absence of information on a study's limitations (see Table 10).

Table 13: Knowledge of colleagues' questionable or unacceptable practices. Change a study in response to pressure, refrain from reporting breaches, include irrelevant references.

	Do you know whether colleagues at your department/unit (department, section, center, etc.) have engaged in this type of practice in the last three years?		
	To change the design, methodology and/or results of a study in response to pressure from stakeholders or funding sources	To refrain from reporting (whistle blowing) serious breaches of research ethical guidelines	To include irrelevant or unnecessary references in a publication in order to increase the citation frequency of a colleague, a research environment or a journal
No	89,5 %	93,0 %	77,6 %
Yes, I know about one incident	3,8 %	3,8 %	4,0 %
Yes, I know about a few incidents	6,0 %	2,7 %	15,1 %
Yes, I know about several incidents	0,7 %	0,5 %	3,3 %
Total	100 % (N=6945)	100 % (N=6875)	100 % (N=7163)

Table 14: Have themselves engaged in questionable or unacceptable practices. Change a study in response to pressure, refrain from reporting breaches, include irrelevant references.

	Have you yourself engaged in this type of practice in the last three years?		
	To change the design, methodology and/or results of a study in response to pressure from stakeholders or funding sources	To refrain from reporting (whistle blowing) serious breaches of research ethical guidelines	To include irrelevant or unnecessary references in a publication in order to increase the citation frequency of a colleague, a research

			environment or a journal
No	95,6 %	95,3 %	87,5 %
Yes, once	2,6 %	2,9 %	5,6 %
Yes, a few times	1,7 %	1,7 %	6,6 %
Yes, several times	0,1 %	0,1 %	0,3 %
Total	100 % (N=7134)	100 % (N=7101)	100 % (N=7154)

Ranking by degree of seriousness

So far, the analysis has revealed differences in the perception of the degree of seriousness among the 12 practices that we have investigated. All practices were measured on a scale from 1 to 4, where 1 = Not problematic at all, and 4 = Very problematic. By estimating the arithmetic mean and standard deviation of these variables we can obtain further information on the way in which these practices are perceived. The higher the mean value, the more often the practice in question is perceived as problematic. A value below 2.5 will imply a higher tendency for a practice to be perceived as less problematic or not problematic at all.

We have also seen, however, that opinions differ more for some practices than for others. The value of the standard deviation shows the dispersion around the given mean. If this value is high, the dispersion is wide, and there is also a large variation in the responses provided by the given group of respondents. If the value is low, on the other hand, the respondents have given relatively uniform answers. Moreover, according to statistical theory, 68.27% of the values of the units or respondents will be found within ± 1 standard deviation around the mean. If the mean is 3.0 and the standard deviation is 1.0, this will indicate that a little more than 68% of the respondents have answered 2, 3 or 4 to the given question.[8]

On this basis, we can rank the practices by their degree of seriousness and provide a statistical expression of the homogeneity in the respondents' opinions. This is shown in Table 15:

[8]It is questionable whether these two measurements can or should be applied to our data, since none of the variables have a natural zero from which distances can be measured. Both the arithmetic mean, and the standard deviation require variables at what is referred to as the ratio level of measurement. We nevertheless make use of them, partly because it is relatively common to use them for Likert-scaled variables at the ordinal level, but mainly because the results provide a good description of differences and similarities between the various disciplines. The difference between two means can also be tested statistically. If the difference is statistically significant, e.g. at the .05 level, we may assume that the observed difference in the sample is also found in the population in 19 out of 20 cases. We have chosen not to include the results of such testing, for two reasons. First, our sample cannot be deemed to constitute a probability sample. Second, the sample size indicates that small, or even immaterial differences will be statistically significant. For example, with 1000 people in each group and a standard deviation of 0.75, a difference of 3.5 and 3.6 will be statistically significant at the .05 level. Although statistically significant, such a difference will be deemed in the vast majority of cases too small to merit any weight in the substantive interpretation of the results.

Table 15: Ranking of practices by mean values. Standard deviations around the mean

	Mean	Standard deviation
Falsify data	3,96	,324
Fabricate data	3,95	,338
Plagiarism	3,88	,406
Deny authorship despite significant contribution	3,73	,606
Refrain from informing about limitations and/or uncertainties	3,58	,588
Change the design, methodology and/or results of a study in response to pressure	3,55	,678
Refrain from whistle blowing	3,53	,709
Gift authorship	3,36	,763
Use data when its ownership is contested	3,29	,735
Copying others' citations	3,07	,748
Include irrelevant references to increase citation frequency	2,96	,771
Salami slicing	2,81	,812

The results must be deemed clear: falsification of data, fabrication of data and plagiarism are ranked as the most serious of the 12 practices included in the questionnaire. Then follows denial of authorship despite a significant contribution, before three variables are all given mean values around 3.5: refraining from informing end-users and decision-makers about limitations and/or uncertainty, changing designs, methodologies or results in response to pressure, and refraining from reporting breaches (‘whistleblowing’).

At the bottom of the rankings, and hence what is perceived as least problematic, we find copying citations and including irrelevant references to increase somebody’s citation frequency, and in the final position we find the segmenting, or ‘salami slicing’, of research results. Not unexpectedly, the standard deviations are higher for variables with lower mean values. With regard to these practices, the different disciplines disagree to a greater extent than what is seen for the other variables.

Comparison of disciplines

It is a well-known fact that the way in which research is organised varies considerably between disciplines. While co-authorship, sometimes including a large number or researchers, is common in some disciplines, sole authorship tends to dominate in others. What is deemed a significant contribution to a research project and hence would qualify for co-authorship can also vary.

In the humanities and social sciences, research is most often undertaken by individuals or relatively small groups. In medicine and the natural sciences, on the other hand, the project and research groups can be very large. Are these differences reflected in perceptions of the practices that we have analysed above?

Below we compare the mean scores that various disciplines give to the 12 practices we have analysed above.

The results both supplement and confirm the impression we formed in the review of the frequency distributions. Where the univariate distributions testify to a large degree of consensus, the differences between the disciplines also tend to be minor. Where the distribution analysis indicates a greater degree of disagreement, we also find examples of clearer differences between the disciplines. However, asserting that the observed differences are a result of disciplinary affiliation alone is problematic.

Nor do any statistical measures of the correlation between variables that measure attitudes to practices and the discipline variable lend support to such a categorical conclusion.[9]

However, some intra-disciplinary variations or oppositions are revealed. In other words: some disciplines appear to be somewhat more polarised than others, but this polarisation cannot be described as strong. For all of the variables that we have analysed, the intra-disciplinary variances are therefore clearly stronger than the inter-disciplinary variances.

On the two first variables – gift authorship and denial of authorship – the humanities and social sciences stand out with somewhat higher mean scores than the other disciplines:

Table 16. Variations between disciplines. 'Gift authorship', denying authorship despite significant contribution to a scientific work and 'salami slicing'

	To accept, mandate or allocate authorship based on criteria other than significant contribution to a scientific work (gift authorship)		To deny or omit authorship despite significant contribution to a scientific work		To break up or segment study results into two or more publications to boost your publication credits, at the expense of scientific quality (salami slicing)	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Humanities	3,51	,725	3,81	,517	2,94	,777
Social sciences	3,49	,711	3,80	,518	2,86	,793
Natural sciences and mathematics	3,21	,765	3,68	,677	2,69	,809
Medicine and health sciences	3,40	,741	3,73	,582	2,88	,821

[9]Eta and eta-squared are two measures that are commonly used for testing this. The value of eta-squared does not exceed .04 in any of the cases. The *internal* variations within the disciplines is therefore clearly stronger than the variations *between* the disciplines for all the variables that we analyse.

Technology and engineering	3,11	,810	3,62	,734	2,63	,812
Agriculture, fisheries and veterinary sciences	3,26	,761	3,65	,659	2,64	,826
Arts	2,98	1,01	3,69	,629	2,96	,880
Not sure / other	3,45	,707	3,72	,620	2,84	,790
Total, all disciplines	3,36 (N=7226)	,763	3,73 (N=7228)	,606	2,81 (N=7213)	,812

Overall, however, the differences are minor, in the region of 0.1–0.3 points. Nor are the differences between the standard deviations for the various disciplines of a magnitude indicating that they merit any particular weight, even though statistical tests show that the largest differences are statistically significant at the .05 level.

The same applies to attitudes to fabricating material, falsifying data and plagiarism. The differences between the mean values are minimal:

Table 17. Differences between disciplines. Fabrication, falsification, plagiarism

	To fabricate (invent) data/material		To falsify data/material		To present other people's work (ideas, material, text) as your own by excluding a reference to the original source (plagiarism)	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Humanities	3,97	,229	3,98	,213	3,92	,305
Social sciences	3,97	,275	3,97	,289	3,90	,365
Natural sciences and mathematics	3,92	,422	3,93	,416	3,83	,486
Medicine and health sciences	3,96	,294	3,98	,242	3,91	,362
Technology and engineering	3,92	,407	3,92	,418	3,84	,468
Agriculture, fisheries and veterinary sciences	3,95	,359	3,96	,335	3,85	,468

Arts	3,86	,506	3,94	,340	3,89	,394
Not sure / other	3,91	,446	3,95	,358	3,83	,461
Total, all disciplines	3,95 (N=7227)	,338	3,96 (N=7224)	,324	3,88 (N=7231)	,406

Despite the fact that the standard deviations for the mathematics/natural sciences and technology/engineering disciplines are nearly double that of the humanities, this does not change the main impression: there is a large degree of consensus regarding these issues, internally as well as between the disciplines. The greatest degree of homogeneity is found among humanists and social scientists. There is some more variation among the mathematicians/natural scientists, technologists and engineers, but not significantly so.

The same pattern recurs in the question about copying citations, using data with contested ownership and refraining from informing end-users and decision-makers about limitations and uncertainty:

Table 18. Differences between disciplines. Copying citations, using data whose ownership is contested, refraining from providing information on limitations and uncertainties

	To create the impression of having consulted a source by copying others' citations		To use research data/material when its ownership is contested		To refrain from informing end-users and decision-makers about significant limitations and/or uncertainties in the data material, analysis and/or conclusion	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Humanities	3,19	,711	3,29	,734	3,64	,580
Social sciences	3,04	,729	3,30	,709	3,58	,596
Natural sciences and mathematics	2,92	,766	3,18	,774	3,47	,692
Medicine and health sciences	3,24	,711	3,48	,637	3,65	,587
Technology and engineering	2,97	,774	3,15	,812	3,41	,681
Agriculture, fisheries and veterinary sciences	2,98	,742	3,32	,749	3,54	,622

Arts	3,18	,837	3,18	,754	3,58	,586
Not sure / other	3,19	,744	3,26	,753	3,58	,588
Total, all disciplines	3,07 (N=7222)	,748	3,29 (N7168)	,735	3,56 (N=7202)	,629

These practices are perceived as somewhat less serious in the disciplines of natural science and technology than among their colleagues in the humanities, social sciences and medicine. For these three variables, the highest mean values are found among medical researchers, but yet again the differences amount to no more than 0.3 percentage points.

For the three final practices – changing a study in response to pressure, refraining for reporting breaches and including irrelevant references – the natural sciences, technology and engineering have somewhat lower mean scores than those in other disciplines. The differences are also minor for these variables, approximately 0.2 percentage points, as are the differences in standard deviations:

Table 19. Differences between disciplines. Change a study in response to pressure, refrain from reporting breaches, include irrelevant references

	To change the design, methodology and/or results of a study in response to pressure from stakeholders or funding sources		To refrain from reporting (whistle blowing) serious breaches of research ethical guidelines		To include irrelevant or unnecessary references in a publication in order to increase the citation frequency of a colleague, a research environment or a journal	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
Humanities	3,71	,559	3,61	,764	3,08	,764
Social sciences	3,65	,594	3,58	,757	2,94	,757
Natural sciences and mathematics	3,57	,693	3,44	,782	2,81	,782
Medicine and health sciences	3,73	,555	3,66	,755	3,08	,755
Technology and engineering	3,48	,755	3,43	,788	2,83	,788
Agriculture, fisheries and veterinary sciences	3,63	,661	3,55	,820	2,94	,820
Arts	3,67	,645	3,66	,787	3,12	,787

Not sure / other	3,55	,678	3,53	,771	2,96	,771
Total, all disciplines	3,56 (N=7208)	,629	3,56 (N=7209)	,650	2,95 (N=7214)	,777

The main impression is thus that a large degree of consensus prevails in terms of what constitutes the most and least serious breaches of research ethics. Falsification of data, fabrication of data and plagiarism are considered the most serious breaches of good research practice in all disciplines. At the other end of the scale we find copying citations and inclusion of irrelevant references to increase someone's citation frequency, and at the very bottom we find segmenting study results or 'salami slicing' the publications from a research project.

Conclusion

Do these results testify to a normative consensus in the research community? On the one hand we find a large degree of consensus regarding all issues pertaining to the fabrication, falsification and plagiarising of data, as well as for many of the questions that focus on questionable research practices. This applies across the disciplines. However, we also find that some forms of questionable practices, such as strategic citation, salami slicing and gift authorship, encounter less opposition among some researchers. This indicates a possible gap between norms and practices in these areas.

Compared to previous studies (Elgesem et al., 1997) and an international meta-analysis (Fanelli, 2009), there is little self-reporting of FFP and many of the questionable practices. When it comes to QRPs, however, the picture is more complex. Moreover, we cannot exclude the possibility of underreporting on this topic.

In a perspective of research ethics, it is interesting to note that a large number of respondents report that they have never had any training in research ethics. Some also report to be uncertain about where to report possible scientific misconduct. This is an indication of some deficiencies in the preventive work on research ethics.

The data material presented in the quantitative part of RINO is rich and comprehensive. The material paves the way for further and more advanced statistical analyses than those presented in this first report, for example to reveal clustering and patterns in the data. These analyses will be reserved for a later publication.

* * * *

Appendix 1:

Project organisation and management

The project is a collaborative research project between the University of Bergen (UiB), the Norwegian National Research Ethics Committees (FEK), and the Western Norway University of Applied Sciences (HVL). The project has a steering group, a working group, and a reference group.

Working group:

Composition:

Professor Matthias Kaiser (UiB) (PI = Principal investigator)
Professor Ole Bjørn Rekdal (HVL)
Director NENT Helene Ingierd (FEK)
Professor Johs Hjellbrekke (UiB)
Communications Officer Ingrid S. Torp (FEK, since 2017)
Project researcher Laura Drivdal (UiB, replacing Lise Augustson, 2016-2017)
Secretary: Senior adviser Heidi Skramstad (HVL)

Mandate:

The working group will be in charge of progress in the planning, execution, and dissemination of the project.

Work:

The PI will guide the work of the employed researcher (Laura Drivdal, replacing Lise Augustson), and all the group members will actively participate in developing the questionnaire for the quantitative study, and later the research protocol for qualitative studies, as well as carry out the analyses and interpretations of the data. The working group will further collectively participate in writing reports and papers for publication. All outreach and publications will follow standards of authorship, and mutual agreements in this regard will be sought in an early phase of the project development.
The working group reports to the steering group through the PI.

Steering group

Composition:

Pro-Rector Margareth Hagen (UiB)

Pro-Rector Gro Anita Fonnes Flaten (HVL)

Senior Adviser Torunn Ellefsen (FEK)

Observer: Principal investigator Matthias Kaiser (UiB)

Secretary: Senior Adviser Heidi Skramstad (HVL)

Mandate:

The steering group will oversee the project and assure

• that the agreed project goals and plans are properly administrated

• that the budgets are held and managed according to the project outlines

• that the project is properly funded

• a broad and adequate dissemination of the project results

• consider the need for changes in the composition of the reference group and the working group.

Reference group

Composition:

Jan Helge Solbakk (Medicine, UiO)

Aslaug Nyrnes (SEKKK, HVL)

Torkild Vinther (FEK)

Vidar Enebakk (FEK)

Anne Marit Blokhus (Chemistry, UiB)

Kristin Hinna (The Norwegian Association of Researchers, HVL)

Ingrid Ballo (PhD Candidate, UiB)

Svein Nordenson (SINTEF, NENT, FFA)

Ole Andreas Rognstad, (Law, UiO)

Observer: Principal investigator Matthias Kaiser (UiB)

Observer: Laura Drivdal (UiB)

Secretary: Senior Adviser Heidi Skramstad (HVL)

Mandate:

The reference group will act as advisor for the working group, and

• contribute in developing study design, analysis, interpretations, and the dissemination

• discuss the theoretical framework for research ethics

• suggest strategies to the institutions on how to promote research integrity

• promote the study within their own networks.

Work:

The reference group will advise the working group throughout the project. The work within the group will be based on dialogue and it will not be required for the group to reach consensus or common views. The group will not have authority in decision-making, but its voice will be heard in all relevant matters. Members are free to individually suggest topics for consideration. The group will meet once or twice annually, and communication via email or phone may be the rule (due to financial limits). Members could also be contacted individually if their field of competence is needed.

The reference group decided not to elect a chair or speaker, but act as a collective.

Appendix 2:

In a European context, we are now seeing a strong focus on supporting research projects and coordination and support actions (CSA) where integrity in research is the main theme. This is an overview of some relevant projects:

EnTire - 'Mapping Normative Frameworks for EThics and Integrity of Research' (2017–2021), aims at making the normative framework governing RE+RI accessible, through establishing a dynamic online Wiki platform, owned by the community of RE+RI stakeholders.

PRINTEGER - 'Promoting Integrity as an Integral Dimension of Excellence in Research' (2015–2018), funded under H2020-EU.5.f., aims to improve integrity policies of national and international research organisations, providing better tools for research leaders and managers, and contributing to improve ethical awareness and reflection through the education of new generations of scientists with next generation educational tools.

ENERI - 'European Network of Research Ethics and Research Integrity' (2016–2019), establishes an operable platform of actors in the fields of research ethics and research integrity, connecting specifically the ENRIO network with the EUREC network.

TRUST - 'Creating and enhancing TRUSTworthy, responsible and equitable partnerships in international research', aims at fostering adherence to high ethical standards in research globally, and counteracting the practice of 'Ethics dumping'.

RESPECT - 'Professional and Ethical Codes for Technology-related Socio-Economic Research'. Funded by the EC's Information Society Technologies (IST) Programme, the RESPECT project developed the comprehensive EU Code of Ethics for Socio-Economic Research.

DEFORM – 'Determine the Financial and Global Impact of Research Misconduct' (2016–2018), aims at analysing the occurrence of research malpractice, modelling related risks and loss of opportunity, and proposing a methodology and guidelines for anticipating, preventing and mitigating the appearance of such practices.

Many of the projects mentioned above have Norwegian partners or Norwegian researchers involved in other functions (e.g. on their advisory boards). Two of these projects, PRINTEGER and DEFORM, have recently conducted small-scale surveys, partly also with a strong focus on the working environment and systemic factors that underlie misconduct or lack of integrity. Kaiser, project leader for RINO, is involved in both these projects (and is a partner of ENERI). Discussions around these projects and their empirical studies have inspired and informed our RINO project, and their questionnaires were assessed before RINO developed its own questionnaire.