

Scientific dishonesty: European reflections

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Abstract

Scientific dishonesty has attracted increased attention around the world during the past three to four decades. Europe became aware of the problem later than the USA, but has within the past 10 years created national control systems for all biomedical projects, not only those supported by public money. The prevalence of the problem can only be calculated indirectly by referring to population figures as denominators. Measured this way, figures from Denmark as a whole show: 1-2 cases referred/million inhabitants/year, 1 case treated/million inhabitants/year, 1 case of scientific dishonesty/million inhabitants/5 years. For Finland, 1-2 cases were referred/million inhabitants/1-2 years; for Norway, similar figures of 1/4 million inhabitants/year were calculated. Figures from the Danish national independent control body 1993-7 show the distribution of the types of cases that were charged, with numbers of confirmed cases in parentheses: fabrication, 2 (1); plagiarism, 3 (0); theft, 2 (0); ghost authorship, 2 (1); false methodological description, 3 (1); twisted statistics, 2 (0); suppression of existing data, 4 (0); unwarranted use of data, 4 (0); and authorship problems, 8 (1). This survey emphasises the need for national guidelines, an independent national control body, and initiatives for strong preventive actions.

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The concept of dishonesty has existed since the early days of human civilisation. The reason is obvious: trust and reliability are so fundamental to human relationships that transgressions with the aim of short circuiting the costs of reliability inevitably appeared early on in our history, as a consequence of a natural psychological law. However, dishonesty outside daily life and politics, for instance in science, was thought to be non-existent (except in a few famous cases) and this illusion lasted until the past three to four decades.

The European scientific community received the first reports of large scale scientific dishonesty from the USA with shock and even some self righteousness. However, European cases soon appeared in countries that were looking out for the phenomenon.

The following discussion focuses on those European countries that have targeted scientific dishonesty and have created control organs. However, it is expected that the increasing number of inter-European biomed-

ical, multicentre projects will catalyse the development of a common European policy on scientific dishonesty within the next few years, in parallel with a similar coordination of rules and control bodies for research ethics, which are already in preparation.¹

In Europe, we have taken so long to accept that dishonesty can occur in the research community because there is a widespread illusion among scientists themselves, and in European societies as a whole, that cognitive skills and personal honesty are correlated, with a very high *r* value and a correspondingly very low *p* value. The taboo was lifted after the disclosure of several European cases, showing that personal honesty and intelligence are not necessarily linked. In a strongly competitive environment, such as the global scientific society, ambitions and vanity sometimes completely outweigh ethics and a sense of fairness.

How great is the problem?

Seen from a northern European viewpoint, the incidence of scientific dishonesty within the health sciences is not high, but is still high enough to warrant attention, control, and prevention. The size of the problem depends among other influences upon the definition of scientific dishonesty. If lapses as a result of error are included the magnitude of the problem would be open ended. The following epidemiological figures rest on a definition of scientific dishonesty not including "honest mistakes"—the definition applied includes a component of the scientist's intention to behave dishonestly. Gross slovenliness despite extensive experience belongs to the definition used, but no such cases were disclosed.

The measurement of the prevalence of scientific dishonesty needs a relatively precise figure of the total number of active, biomedical scientists in a given country, including those not supported by public money or not doing research involving humans (even projects involving humans are only reported if a national research ethical control system exists). To inform countries planning to establish national systems for the disclosure and prevention of scientific dishonesty about the administrative workload of such a system, normal epidemiological figures with the denominator of 100 000 inhabitants can be valuable. Obviously, such figures can only be transferred cautiously between countries of similar scientific and economic standards.

Approximately six years' experience with the dishonesty concepts and types and their absolute and relative representation within the incidences of handled cases in the Nordic countries with national control systems have produced the following figures. Denmark:

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cases referred, 1–2/million inhabitants/year; cases treated, 1/million inhabitants/year; cases of scientific dishonesty, 1/million inhabitants/5 years. Finland: cases referred, 1–2/million inhabitants/2 years. Norway: cases referred, 1/4 million inhabitants/year. Sweden: incidences not published.

Types of transgressions

Statistics from the Danish national independent control body 1993–7 have shown the following numbers of cases that have fallen within the scope of dishonesty.² The first of the following figures indicates the number of cases charged with a particular type of dishonesty; the figure in parenthesis indicates the number of confirmed cases. Fabrication, 2 (1); plagiarism, 3 (0); theft, 2 (0); ghost authorship, 2 (1); false methodological description, 3 (1); twisted statistics, 2 (0); suppression of existing data, 4 (0); unwarranted use of data, 4 (0); authorship problems, 8 (1).

Several cases were placed in the grey zone³ between scientific dishonesty and good scientific practice. The spectrum and the numbers were the following. Personal removal of a scientific biobank from a research institution, 1; unauthorised publication—including superiors as co-authors without their knowledge and consent, 1; gift authorship, 2; exclusion of potential authors, 3; inadequate citations with accusation of “priority lifting”, 2; inadequate agreements on the access to research data for co-workers, 5.

The nationwide collection of data has enabled control bodies to subgroup the alleged and confirmed transgressions into three categories, and to localise the most important types, forming the basis for a relevant policy of prevention.

The three groups are: (1) transgressions at the scientific level, (2) transgressions at the level of the scientists themselves, and (3) transgressions at the level of good scientific practice. Transgressions at the scientific level are related to the research process itself and the resulting data. Here one finds fabrication, plagiarism, and the deletion of unwanted results. Transgressions at the level of the scientists themselves involve unfair relations between scientists; for instance, unrightful access to original ideas and observations, and unrightful authorship or the exclusion of potential authors, as young “water-carriers”. In this last type of dishonesty, the scientific data are mostly reliable, but the balance between the researchers involved is incorrect because some of those who did the research have been excluded.⁴

What can be done and what must be done?

To secure scientific credibility, on a national and a global scale, two different lines should be followed, namely: (1) the creation of an independent control body, easily accessible for researchers as “whistleblowers”, and by research technicians, editors, and institutions such as universities; and (2) the creation of comprehensive preventive measures.

In general, the experience from single institutions carrying out inquiries, investigations, and reprisals has been rather negative. These institutional case handlings often take a defensive starting point and suggest that “such things cannot happen in our esteemed, high quality institution”, if they do not totally discourage young scientists and research technicians from acting as “whistleblowers”, or if the institutional chiefs do not want to proceed with a case because the accused is a person bringing in large amounts of external research funds and, consequently, is considered to be an indispensable asset for the institution. If, despite such initial efforts to sweep such cases under the carpet, serious transgressions are identified, individual institutions may have a secondary rebound reaction—to stress the institution’s high ethical standards, a rapid tribunal process is elicited, resulting in strong reprisals without the necessary access to a fair defence for the accused.

This is why northern Europe has created national, independent committees on scientific dishonesty, with a high court judge as the chairman and strong guidelines for procedures, inquiry, and investigation, and with possible reprisals left to the scientist’s institution. Such national committees can receive cases from institutions, individual scientists, or technicians, or the committee can investigate a case on its own initiative.

Until recently, biomedicine has been the only discipline focused upon when discussions of scientific dishonesty have taken place. This has been difficult to understand, because historical examples of scientific dishonesty have covered a wide range—from polar exploration via the natural sciences to the humanities. On a background of five years’ experience with biomedical research and episodic cases from non-biomedical research fields, one European country, Denmark, has taken a further step towards equal conditions for all research disciplines.

As a supplement to an existing law (No. 676 of 19 August 1997), it was decided from 1 January 1999 to change the existing semi-official system to a legally based system, comprising three committees: one for the natural sciences, the agricultural and veterinary sciences, and the technical sciences; one for the health sciences; and one for the social sciences and the humanities. Each committee has its own chairman, but also shares a common chairman, a high court judge.

As a part of the Danish preventive strategy, courses in good scientific practice and scientific dishonesty have been made obligatory for young biomedical scientists. In addition, the committee on scientific dishonesty (for the biomedical sciences) has published detailed annual reports, which aim to strengthen good research standards and to warn about scientific fraud. Both measures are expected to be applied within a European convergence of ethical standards in the coming years.

The need for national guidelines

Nordic initiatives have been taken to import some fundamental judicial principles into this area to avoid accusations of scientific dishonesty (except for the few serious cases that are also transgressions of criminal law) without the existence of published rules, which define the standards of good scientific practice. In Denmark, the committee on scientific dishonesty has published three sets of guidelines⁵ covering: (1) agreements at the initiation of projects,⁶ (2) rights and duties concerning the storage and use of research data,⁷ and (3) the definition of authorship.⁸

There are often no agreements made between groups of scientists before they embark on large projects. Such formal agreements would help to prevent later quarrels and accusations of dishonesty. The guideline on agreements says that its "list comprises points, which it may be advantageous to have discussed and agreed on at the initiation of research projects, especially when several centres or departments participate in the project. Smaller research groups may not need formal agreements, but the more complex the collaboration structure, the greater the need for agreements. Such agreements may be based on a selection or all of the points in the list. The scope of the contract must depend on the research group's concrete evaluation. The list may serve as a checklist for agreements as well as for the many activities necessary during the course of the project."⁶

When scientists are accused of dishonesty, the lack of guidelines on the assessment and storage of data have sometimes been cited as the reason, and have at the same time made it difficult for the accused scientist to document his or her innocence. The guidelines say in the preamble: "It is recommended to abide by the following guidelines on rights and duties concerning storage and use of research data in order to promote good scientific practice and prevent conflicts between scientists or research institutions and other parties."⁷

Probably the most important type of transgressions—in serious cases within the field of scientific dishonesty, in other cases in the grey zone of insufficient scientific standards—is unrightful authorship. The guidelines describe in detail all the ethical and unethical aspects of the authorship concept. The guidelines suggest strengthening the Vancouver rules⁹ and making them more operational: "The right to authorship is obtained through a creative effort and only through this. The extent and nature of this is described in the Vancouver rules, the central principles of which have been incorporated into these guidelines. The following four requirements shall all be fulfilled in order to obtain the right to authorship:

(1) An author shall have contributed substantially to the creative process usually within more than one of the following elements: idea, planning, experimental work, collection of clinical or clinical-epidemiological data, analysis of data and interpretation of these.

- (2) An author shall have contributed substantially to the preparation of the resulting article through participation in the preparation of manuscript drafts or through a critical revision of importance for the appearance of the article.
- (3) An author shall in writing accept the final draft of the manuscript. At the same time a comprehensive co-author statement should be prepared describing precisely the nature and extent of each author's contribution without using stereotype language. It should be signed by all authors and be kept by them in order to be submitted to journals requiring such a statement and further used for applications and for documentation of scientific merits when submitting academic dissertations.
- (4) An author shall be able to present a detailed account of his or her contribution and shall have participated to such a degree in the totality of the work, that he or she is able to review the content of the whole manuscript and discuss principal aspects of the contributions. All authors of an article have, within the limits of the reasonable and the possible, a co-responsibility for it being based on honest research."

Because the Vancouver principles, despite their good intentions, have not been followed by biomedical scientists, initiatives have been taken to strengthen the procedures for judging whether a given authorship is rightful. A tighter coupling of credit and responsibility can be achieved by introducing a contributor concept,^{10 11} and/or demanding very detailed descriptions of each author's contribution and that copies of these signed statements must accompany all CVs containing the given reference in later major grant or job applications.⁸

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