



PUBLICATION MALPRACTICE AND FRAUD FOR SURGEONS

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Introduction

Publication malpractice and publication fraud are major challenges to the integrity of the world's professional and scientific literature. Regrettably, some of those who perpetrate it are members of the medical profession. From time to time, a journal editor is faced with quite outrageous examples of deceit and fraud. Some examples are headed off at the pass, but others undoubtedly slip through an imperfect professional net, sometimes to be detected many years later.

In this article, I consider the range of publication fraud; the reasons why it is not a victimless crime; the means by which it is increasingly being detected; and the consequences for the perpetrators, from the perspectives of the Editor of a peer reviewed surgical journal with a broad international authorship.

The motives for publication fraud

Publication fraud may be viewed as the deliberate misrepresentation of research accomplishments and findings to advance a research programme, to secure sources of funding, or quite simply for personal professional advancement at least effort and to disguise personal inadequacies.

Professional career success and public recognition are significantly influenced by publication records and published work. Academic institutions place great store on the publication productivity of their staff, and a whole industry of citation metrics exists to measure and quantity academic output. There is, thus, great pressure on individuals to publish. The damaging professional myth of "publish or perish" is bandied about, where volume of publications is perceived to equate with intellectual energy and professional effectiveness. In truth, publication quantity is no substitute for quality. The double Biochemistry Nobel Prize laureate Fred Sanger at the University of Cambridge was quoted as saying that he rarely published, and then only every eight years or so. His infrequent publications each had considerable impact.

The international medical scientific literature has been accumulating over many centuries, and at an increasing rate as the technologies of print and information distribution change. It contains a small number of world and life changing papers and books; many very good and important papers and books; and a mass of papers and books of lesser interest which are rarely, if ever, cited.

In order to get noticed, it becomes more and more difficult to find original angles and to make an impact. For the gifted few, publication success

flows easily. For the grafting many, small and original contributions come with time and effort. For a number of individuals without such talent or commitment, plagiarism (copying) of the work of others may appear as an easier route to recognition than personal graft.

Why does dishonesty in publication really matter? Medical science flourishes on trust. The world's journal repository is vast, and there are many places in which to lodge and lose suspect science. However, if plagiarism and malpractice are allowed to flourish, the scientific literature becomes progressively contaminated and overburdened with unreliable and untrustworthy work, and the public reputation of the profession sinks and stinks.

Misleading, unvalidated and dishonest work can lead to inappropriate actions in medical practice which can misdirect huge resources and, at worst, can lead to death. At best, they waste professional effort, time and resources in unravelling and cross-checking the work of others. Your colleagues and collaborators, your unit, your hospital, your university, your corporation or even your country may suffer serious professional and reputational damage which may take years of restoration. For example, the reputation of the South Korean scientific community was seriously undermined in late 2005 by the revelation that an entire stem cell research programme, under the direction of Professor Hwang Woo-Suk at the Korean National University, was built on wholly fictional and dishonest data. Woo-Suk had become a national hero on the basis of fraudulent work which had given him two papers in *Science* in 2004 and 2005 on the creation of human embryonic stem cells by cloning.

Definitions and the scope of Malpractice

Publication malpractice can range from minor, inadvertent and forgivable errors to wilful fraud which might be judged as criminal intent. At the heart of malpractice is plagiarism, which is the copying and passing off of the work of others as one's own without recognition or attribution. The act of copying in itself is not wrong. Indeed, the entire basis of citation would be undermined if selective quotation were outlawed. The key moral obligation is to make appropriate reference to the work of others, rather than to conceal the origins.

High standards of study design, departmental, institutional and Ethical Oversight of all work coming out of a department often help eliminate publication misconduct at source, and help eliminate the following forms of mild to serious publication malpractice:

Deliberate deception: The World Association of Medical Editors, WAME, sets out the following definition on its website: "*Deception may be deliberate, by reckless disregard of possible consequences, or by ignorance. Since the underlying goal of misconduct is to deliberately deceive others as to the truth, the journal's preliminary investigation of potential misconduct must take into account not only the particular act or omission, but also the apparent intention (as best it can be determined) of the person involved.*

One example of such deliberate fraud which came to our notice at the EJSO involved the precise replication and re-submission of a paper on naso-jejunal feeding under new surgical authorship which had appeared 10 years previously in a journal which had subsequently folded. The perpetrators, who clearly thought that their fraud would have no chance of detection, had not reckoned with the powers of observation and memory of one astute reviewer.

Self-plagiarism: This refers the practice of an author using portions of their previous writings on the same topic in another of their publications, without specifically citing it formally in quotes.

Duplicate publication: This practice is widespread and sometimes unintentional. It commonly arises where work in a local language paper is resubmitted to an English language journal to reach a wider audience. Moves towards the English language as the standard medium of international scientific communication, combined with the much greater transparency for all papers on the Internet, should reduce the need for dual publication on language grounds alone. A variant on this process is **simultaneous submission**, which is the concurrent submission of the same manuscript to multiple journals. This wastes the time of editors and publishers who may invest considerable resources in assessing the manuscript, and it may lead to duplicate publication.

Salami Slicing: This is another form of multiple publication, which unnecessarily inflates the literature. It takes a body of work which could be covered in a single paper, and divides it up into as many component parts as possible. It is difficult to address if the components are sent to different journals, but the practice becomes very evident over time on the citation indices. The most outrageously entertaining example of this practice which I have seen was when we received a seemingly well written paper some years ago at the EJSO on the expression of a particular protein in a modest cohort of lung cancers which was accepted. We then received eight further papers in short order from the same group reporting the same series of tumours, in each case with a different protein. It became obvious that they were simply working through the results of a single micro-array analysis which could, and should, have been written up in one paper. We rejected the entire cohort of papers with a recommendation that they should be rewritten into one paper.

Near-duplicate publication: This is a variant on salami slicing, in which the same material or series is used repeatedly with minor changes. For example, through republishing, on an annual basis, the same case series with marginal additional short-term follow up information. The repeat publication of the same or related results artificially inflates both the author's publication record and the general literature.

Reverse salami slicing or jigsaw reconstruction: I have recently adjudicated on three papers submitted to the EJSO which fraud detection software demonstrated to be re-assemblies of

component papers. This would be a seemingly clever and putatively undetectable fraud but for the power of text comparison systems.

Improprieties of authorship: Improper assignment of credit, such as excluding others, misrepresentation of the same material as original in more than one publication, inclusion of individuals as authors who have not made a definite contribution to the work published; or submission of multi-authored publications without the concurrence of all authors.

Misappropriation of the ideas of others: An important aspect of scholarly activity is the exchange of ideas among colleagues. Authors can acquire novel ideas from others during the process of reviewing grant applications and manuscripts.

Violation of accepted research practices: Serious deviation from accepted practices in proposing or carrying out research, improper manipulation of experiments to obtain biased results, deceptive statistical or analytical manipulations, or improper reporting of results.

Material failure to comply with legislative and regulatory requirements affecting research: Including, but not limited to, violations of applicable local regulations and law involving the use of funds, care of animals, human subjects, investigational drugs, recombinant products, new devices, or radioactive, biologic, or chemical materials.

Inappropriate behaviour in relation to misconduct: This includes unfounded or knowingly false accusations of misconduct, failure to report known or suspected misconduct, withholding or destruction of information relevant to a claim of misconduct and retaliation against persons involved in the allegation or investigation.

Data fabrication: This is the act of creating data to fit the purposes of the paper and its authors. This may range from small quantities of data to complete a series, to the fraudulent creation of entire papers from scratch. Forensic statistical analysis will often reveal such frauds, as the intricacies and variability of true raw data can be difficult to replicate in synthetic data.

Responsibilities in countering malpractice

These lie squarely with those perpetrating the fraud. Nevertheless, education about those marginal aspects of misconduct where genuine confusion might arise, combined with awareness of the power of modern fraud detection systems, should help reduce fraud to a minimum. Notwithstanding protestations of innocence and ignorance from the perpetrators, major fraud is as obvious as the elephant in the room when you see it.

WAME states that "*Journals should have a clear policy on handling concerns or allegations about misconduct, which can arise regarding authors, reviewers, editors, and others. Journals do not have the resources or the authority to conduct a formal judicial inquiry or arrive at a formal conclusion regarding misconduct. That process is the role of the individual's employer, university,*





granting agency, or regulatory body. However, journals do have a responsibility to help protect the integrity of the public scientific record by sharing reasonable concerns with authorities who can conduct such an investigation."

Publication fraud detection systems

Editors, reviewers and readers cannot be expected to spot wilful and devious misdemeanours in the publication process, and examples in my own experience have usually come to light by extraordinary coincidence. In one of our cases, a reviewer spotted his own work in a manuscript submitted for review. This role of luck suggests that many more examples go undetected. Some malpractice can be detected in advance of publication by simple checks on the authors and on the related literature using PubMed or other citation systems. This can be very helpful in identifying duplicate and near-duplicate publication and salami slicing.

Automated plagiarism detection systems

Sophisticated software and text comparison systems are now under development for the detection of publication fraud. One only needs to consider the functionality of search engines such as Google, which can trawl and compare huge quantities of data almost instantaneously, to realise the potential of computer systems in this role. Some of these systems have evolved from academic plagiarism detection systems. For example:

Turnitin™ is a plagiarism detection service which was originally developed for academic and undergraduate use. Students submit their papers electronically to the system, which compares the content of those papers to over a billion other papers and documents. Turnitin highlights any similarities and supplies an annotated document showing both the student's paper and the original source. This document is called the *Originality Report*. Turnitin uses three continually updated content bases, which trawl billions of pages of web content; hundreds of millions of pages of proprietary content from subscription-based publications, books, newspapers, magazines and scholarly journals; and 100 million+ student papers previously submitted to Turnitin in over 30 languages.

CrossRef™ is the official Digital Object Identifier (DOI) registration agency for scholarly and professional publications. It was established in 2000 as an independent, non-profit membership association and the citation-linking backbone for online publications and the navigation of electronic journals across digital internet platforms provided by individual publishers, using open-standards technology.

CrossCheck™ is a database system which has grown from work between CrossRef and iParadigms, a developer of plagiarism screening systems, using the **iThenticate™** tool for checking documents against the database. Publishers' content is trawled in much the same way that a search engine indexes full text. The system then produces a "similarity report" which

shows the percentage of the document that matches other content in the database, where that content comes from, and the matching content itself. Publishers can then check new manuscripts against the database and, optionally, the wider internet. By integrating systems such as CrossCheck with electronic submission systems for manuscripts, it will be possible in due course to undertake "up front" plagiarism checking very early in the manuscript acceptance process.

The Déjà vu™ Plagiarism Detection System is an academic project developed at the University of Texas Southwestern Medical Center for the detection of plagiarism and covert multiple publications of the same data. The developers report that, in 2002, an anonymous survey of 3,247 US biomedical researchers asking them to admit to questionable behaviour revealed that 4.7% admitted to repeated publication of the same results and 1.4% to plagiarism. In general, the problem of duplication of scientific articles has largely been ignored by the publishers and database curators. Extrapolation of the results of an anonymous survey to the Medline database of more than 17 million citations predicts some 800,000 such cases on Medline. In recent work, Deja Vu searched a subset of 62,000+ Medline abstracts. 421 potential duplicates were found and further investigated. Three of these papers which were referred to us at the EJSO were found to be almost identical "jigsaw" reconstructs of related papers by other authors, which we subsequently decided to retract formally from the literature. Extrapolating to the subset of Medline records that have abstracts (8.7 million), this would correspond to roughly 117,500 duplicates with the same authors.

Simultaneous submission: The Déjà vu database also contains many pairs of highly similar abstracts with overlapping authors that appear in the same month, all apparently acts of simultaneous submission to multiple journals. In general, duplicates are often published in less prominent journals with lower impact factors to minimise the odds of detection. As increasing numbers of journals and publishers put their back catalogues on line and up for checking by tools such as déjà vu, so it is both possible and likely that more such cases will come to light. The Déjà vu team cite various contributing factors to such publication fraud, in that:

- There is considerable international confusion over acceptable publishing behavior.
- There is a perception that there is a high likelihood of escaping detection.
- There is a lack of clear standards for what level of text and figure re-use is appropriate.

Automated text-matching systems must, and will, ultimately become a ubiquitous aspect of the publication process. There will be automatic crosschecking of submitted manuscripts against all published work. The costs of detection arising from participation in unethical duplication practices will progressively become such as to be unacceptable to all but the most desperate (or most skillfully fraudulent) practitioners.

Actions on suspicion of plagiarism

Wise editors and publishers proceed with caution when made aware of alleged fraud and plagiarism, both because of the laws of libel and because the consequences can be career changing for those who commit plagiarism or who are accused on it. Checking can be a time-consuming process, and the evidence must be very strong, as no deliberate fraudster can or will safely admit to the fraud. Editors must develop a sensitive approach and a thick skin during investigations.

Once the editors, publishers and their legal teams have looked at the material and decided on common sense grounds that there is *prima facie* case of plagiarism, the case must be put in writing to the perpetrator, who in turn may:

- Refuse to respond.
- Acknowledge their error and offer to correct it by withdrawing the paper, introducing appropriate references, or issuing a letter or note of formal clarification if their manuscript is already in print.
- Deny all knowledge of the source papers.
- Become agitated and abusive in communications or threaten legal action, which responses are often an indication of guilt.

Sanctions against publication fraud

1. Notifying the fraudster's institution

Where the institution of affiliation of the fraudsters is known, the notice of concern and the evidence for it should be directed to the Head of the institution. At this point, things become murky, because many institutions do not want such problems brought to public attention. They may fail to reply and/or decide to bury the matter locally. The response varies considerably from institution to institution and from country to country in the absence of clear guidance, recognised international law and directives on publication fraud. A reputable institution or university will generally take such allegations seriously, request the evidence and take public and visible action to address the issue and deal with the problem, or refer the fraudster to an appropriate regulatory body for further action.

There are, as yet, no explicit obligations or powers for Editors and publishers to take the matter to professional regulatory bodies; to take the case to advisory bodies such as the Committee on Publication Ethics (COPE); or to take matters to the Police and Criminal investigation authorities in the relevant jurisdiction (although the police may subsequently become involved). Publicity in the media may force public attention to the matter, as has ultimately been the case in all of the documented major scientific frauds. In going public, the complainants must be confident in their grounds, and have taken sound legal advice in advance.

2. The formal retraction notice

If the responses from the perpetrators and the relevant institutions are unsatisfactory; if there is evidence of plagiarism beyond reasonable doubt and coincidence, and if informal approaches have failed to resolve the issue, then a formal retraction notice can be issued by the recipient journal. Retraction is a formal process which places the

event and the suspect paper in the public domain. The US National Library of Medicine makes a clear statement of general application on the issues of retraction and partial retraction, which can be accessed at www.nlm.nih.gov/pubs/factsheets/errata.html. Partial Retractions of erroneous data may also be published.

3. The personal consequences of fraud detection

Publication fraudsters can, and do, escape detection and sanction. However, the personal consequences of being named and shamed as a publication fraudster can be profound, with loss of professional license, status and reputation, and even criminal sanctions in the most rigorous jurisdictions, such as the UK. The General Medical Council takes matters of plagiarism very seriously, and has recently set severe precedents in proven cases.

Future developments in dealing with publication fraud

The work of well intentioned editors and publishers in combating publication fraud in all of its forms is currently constrained by the lack of a consistent international approach to the issues, and even recognition of the problem from one jurisdiction to another. The work of institutions such as COPE, WAME and the Déjà vu team have done much to develop the evidence base, from which further developments will come. We can look forward to the creation of a body of law; a common regulatory approach across international boundaries; a formal and objective classification of publication fraud, and an Internet "hall of shame" database of publication misdemeanors and their perpetrators which is accessible to all editors, publishers, reviewers and readers. Now that so many publishers have recognised the problem, and that the subject is under discussion at a high level in various organisations and bodies, it is likely that such a formal international framework will ultimately be put in place.

In conclusion, case experience demonstrates that publication malpractice in its various forms is commonplace, and that surgeons are, from time to time, involved in serious forms of publication fraud. Awareness of the problem and of the potent systems now available for the detection and notification of such transgressions should reduce inadvertent misconduct. It should help banish thoughts of publication misconduct from the minds of all but those most willfully set upon such foolhardy actions, and in full knowledge of their potential consequences.

Selected References and web links

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