3 deadly data sins and other misdemeanours

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e-Research Africa Conference

Presentation overview

- Introduction: Research integrity / Responsible Conduct of Research

- Compromising research integrity: The 3 deadly data sins and other misdemeanours

  - Compromising the integrity of data

  - Misuse / misrepresentation of data

  - Breaches of ownership and unauthorised access to data

  - Increasing the risk of damage, loss and inaccessibility over time

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Research integrity

Research integrity – what is right and honest

- "Wholeness" of scientific endeavour – above suspicion
- Professional principles

Responsible Conduct of Research (RCR)

- Research ethics – what is good and moral
- Dealing with people: Accountable to research subjects, collaborators, potential users, broader society
- Dealing with data: Quality, access, usability
- Dealing with findings: True, accessible, understandable

A negative counterpart:

Research misconduct

Singapore Statement on Research Integrity

Preamble. The value and benefits of research are vitally dependent on the integrity of research. While there can be and are national and disciplinary differences in the way research is organized and conducted, there are also principles and professional responsibilities that are fundamental to the integrity of research wherever it is undertaken.

PRINCIPLES

Honesty in all aspects of research
Accountability in the conduct of research
Professional courtesy and fairness in working with others
Good stewardship of research on behalf of others

RESPONSIBILITIES

1. Integrity: Researchers should take responsibility for the trustworthiness of their research.

2. Adherence to Regulations: Researchers should be aware of and adhere to regulations and policies related to research.

3. Research Methods: Researchers should employ appropriate research methods, base conclusions on critical analysis of the evidence and report findings and interpretations fully and objectively.

4. Research Records: Researchers should keep clear, accurate records of all research in ways that will allow verification and replication of their work by others.

5. Research Findings: Researchers should share data and findings openly and promptly, as soon as they have had an opportunity to establish priority and ownership claims.

6. Authorship: Researchers should take responsibility for their contributions to all publications, funding applications, reports and other representations of their research. Lists of authors should include all those and only those who meet applicable authorship criteria.

7. Publication Acknowledgement: Researchers should acknowledge in publications the names and roles of those who made significant contributions to the research, including writers, funders, sponsors, and others, but do not meet authorship criteria.

8. Peer Review: Researchers should provide fair, prompt and rigorous evaluations and respect confidentiality when reviewing others' work.

9. Conflict of Interest: Researchers should disclose financial and other conflicts of interest that could compromise the trustworthiness of their work in research proposals, publications and public communications as well as in all review activities.

10. Public Communication: Researchers should limit professional comments to their recognized expertise when engaged in public discussions about the application and importance of research findings and clearly distinguish professional comments from opinions based on personal views.

11. Reporting Irresponsible Research Practices: Researchers should report to the appropriate authorities any suspected research misconduct, including fabrication, falsification or plagiarism, and other irresponsible research practices that undermine the trustworthiness of research, such as carelessness, improperly listing authors, failing to report conflicting data, or the use of misleading analytical methods.

12. Responding to Irresponsible Research Practices: Research institutions, as well as journals, professional organizations and agencies that have commitments to research, should have procedures for responding to allegations of misconduct and other irresponsible research practices and for protecting those who report such behavior in good faith. When misconduct or other irresponsible research practice is confirmed, appropriate actions should be taken promptly, including correcting the research record.

13. Research Environments: Research institutions should create and sustain environments that encourage integrity through education, clear policies, and reasonable standards for advancement, while fostering work environments that support research integrity.

14. Societal Considerations: Researchers and research institutions should recognize that they have an ethical obligation to weigh societal benefits against risks inherent in their work.

The Singapore Statement on Research Integrity was developed as part of the 2nd World Conference on Research Integrity, 21-24 July 2010, in Singapore, as a global guide to the responsible conduct of research. It is not a regulatory document and does not represent the official policies of the countries and organizations that funded and/or participated in the Conference. For official policies, guidance, and regulations relating to research integrity, appropriate national bodies and organizations should be consulted. Available at: www.singaporestatement.org

http://www.singaporestatement.org/

Van Zyl ()

Compromising research integrity

A continuum from good to bad

- Research integrity
- Questionable research practices
- Unacceptable research practices
- Research misconduct

Fabrication, falsification, or **plagiarism**
in proposing, performing, or reviewing
research, or in reporting research results

xxx

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3 deadly data sins and other misdemeanours

- Misconduct
  - Fabrication: making up research data or results and recording or reporting them
  - Falsification: manipulating research materials, equipment, or processes, or changing or omitting research data or results, such that research is not accurately represented in the research record
  - Plagiarism: appropriation of another person's ideas, processes, results, or words without giving appropriate credit
  - Not adhering to relevant legislation, policies
- Irresponsible ("questionable") research practice
  - Practices that do not constitute misconduct or unacceptable research practices but that require attention because they could erode confidence in the integrity of research or creative activities
  - Carelessness

    Does not include honest error or differences of opinion

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3 deadly data sins and other misdemeanours

Integrity of data compromised

- Data collection
  - Fabrication of data by fieldworkers & researchers
  - "Convenient" participant selection
- Data management as part of the research process
  - Poor versioning of data files, lack of documentation (internal metadata), careless manipulation / cleaning
  - Not maintaining master files
- Sharing of data (identifying data / over anonymisation)
- Data curation: not dealing with data integrity issues
  - Data verification / validation
  - Checking anonimysation
  - Unauthorised changes to data
  - No documentation of changes made to data

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Misuse / misrepresentation of data

- Analytical approach and method application
  - Choose methods to skew / influence analysis
  - Inappropriate findings (secondary analysis inappropriate for the data: design, scope, reporting domains)
  - Reporting on only part of the data
- Not reporting on findings which do not support hypotheses (Failing to report conflicting data)
- Reluctance / delayed data sharing
- Curation: data not describe properly/comprehensively
- Use of misleading analytical data (honest error)

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Breaches of ownership and unauthorised access to data

- Not adhering to ownership stipulations
    - Not referencing data sources
    - Claiming ownership which is not the case (authorship)
    - Improper listing of authors
- Not adhering to confidentiality and security protocols
- Selective, informal, insecure sharing of data
- Data curation:
    - Not attending rigorously to authorship, ownership and sharing requirements
    - Share without consent from respondents
    - Share without permission from the owner of the data
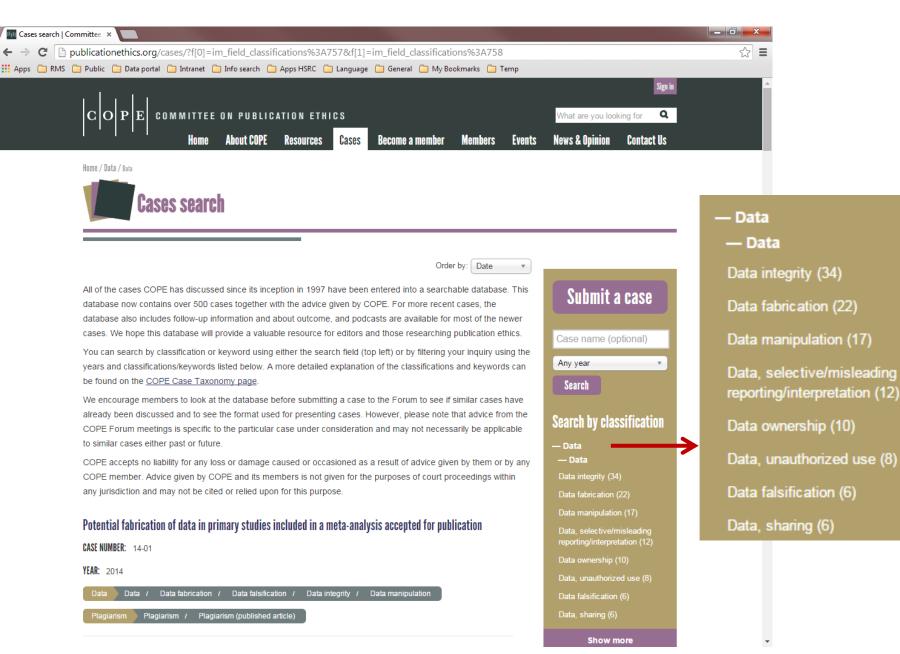
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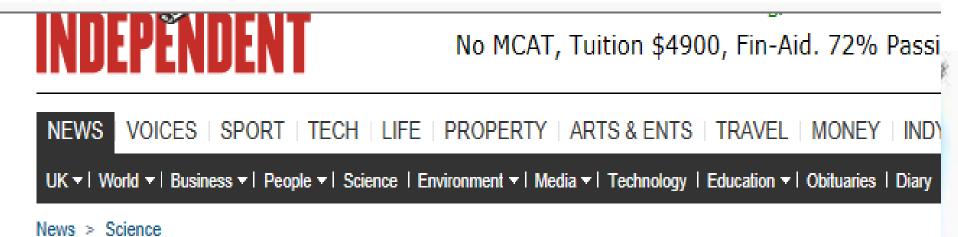# Increased risk of damage, loss and inaccessibility over time

- Carelessness in storing and managing files
  - Multiple copies on multiple devices
  - Lack of or improper versioning
  - Accidental / intentional overwriting or deleting of files
  - Lack of or inadequate backup and disaster recovery
- Keeping files in proprietary data formats over the long term
- Keeping files on degrading media and obsolescent devices

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Case studies

Case study: Fabrication

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News > Science

The bad science scandal: how fact-fabrication is damaging UK's global name for research

After a string of high-profile cases, a new agreement between scientists and the people who fund them aims to usher in a new era of 'research purity'

JOHN LAWLESS | SUNDAY 16 JUNE 2013

Case study: Falsification

17 April 2013 Last updated at 12:48 GMT

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Scientist Steven Eaton jailed for falsifying drug test results

A scientist who faked research data for experimental anti-cancer drugs has been jailed for three months for falsifying test results.

Steven Eaton, from Cambridgeshire, has become the first person in the UK to be jailed under scientific safety laws.

Eaton, 47, was working at the Edinburgh branch of US pharmaceutical firm Aptuit in 2009 when he came up with the scam.

Eaton had been selectively reporting research data since 2003

Case study: Plagiarism

Plagiary

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Author:	Alan R. Price
Title:	Cases of Plagiarism Handled by the United States Office of Research Integrity 1992-2005
Publication Info:	Ann Arbor, MI: MPublishing, University of Michigan Library 2006
Availability:	This work is protected by copyright and may be linked to without seeking permission. Permission must be received for subsequent distribution in print or electronically. Please contact mpub-help@umich.edu for more information.
Source:	*Cases of Plagiarism Handled by the United States Office of Research Integrity 1992-2005* Alan R. Price vol. I, 2006
Article Type:	Paper
URL:	http://hdl.handle.net/2027/spo.5240451.0001.001
PDF:	Download full PDF [405kb]

- Padgett - He was an assistant professor of oral biology from Ohio State University who plagiarized into his own NIH grant application preliminary research data on hormone enhancement of the immune response from another person's company, as alleged by a consultant to that company who had done the work and happened to become a reviewer for NIH. He was subjected by ORI in 2001 to 3 years of certification and non-service. [13]

Implications

- Misconduct can do serious harm
  - to self
  - to others
  - society
  - to scientific enterprise
- May end a promising or prominent career
- Affects the work and reputation of collaborators or other researchers / academics
- Findings from data have wide ranging implications for policy, decision making
- Affects the integrity of science

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Preventing the 3 sins and other misdemeanours

Various role players

- Individuals or teams producing the results
- Institutions housing the research and releasing the results
- Data curators
- Editors, reviewers and publishers
- Funders of research
- Oversight bodies and watchdog organisations

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Preventative measures

- Raise awareness and train researchers
- Promote peer review and secondary use of data
- Curate data and encourage data sharing (Depositing data in organizational repositories and archives)
- During the curation process, focus on
  - Ethics (consent) and de-identifying data without over anonymisation
  - Preservation as soon as data are cleaned
  - Data appraisal for long term preservation
  - Data citations (Authors, producers, distributors)
  - Metadata (Funders, copyright holders, acknowledgements)
  - Conditions of use and sharing parameters
  - Importance of SOPs and rigorous curation practices

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Preventative measures

- Organisations (and individuals) need to take responsibility
    - Promoting good practice
    - Clear guidelines (policies and procedures)
    - Policies should be rigorously implemented.
    - Punishment (sanction) following due procedure (consistency and transparency)
    - Optimization of required technology infrastructure
    - Efficient monitoring, evaluation and management of the whole sphere (data sharing, technologies, policies, procedures)

A concluding thought …

Research data must be famous, not infamous

References

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Thank you

Building the bridge between
research, policy and action

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Data Curation
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