

Research Integrity and Open science: Is sound science open science ?

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Open for you! An introduction series to open science | 20 June 2022















4EU+ Alliance and Open Science

- 4EU+ is a transnational strategic university association.
- Aim: Strengthen the European vision of deepened cooperation and mutual enrichment in research and teaching
- Open Science is an integral part of this.
- Two 4EU+ projects currently work on Open Science.
- Open for you an Introduction Series to Open Science" – 14 session on OS topics!





Agenda

- Research integrity: an introduction
- Research integrity and Open science
- Is sound science open science?



Research integrity: what is it about?

- It is about research process and outcomes.
 - To be distinguished from codes of ethics and research ethics.
- Research conducted according to research integrity principles is just good, sound research.
- Sound research is *difficult*.
 - Beyond voluntary misconducts (Falsification of data, Fabrication of data, Plagiarism, and the grey zone), many risks of errors and bias.
- Cultures of research, involving institutions and all individual participants



Institutions are not passive!

- Office of Research Integrity (USA), UK Research Integrity Office (<u>https://ukrio.org/</u>) and Concordat, Research Integrity Officers in Universities (European Network of Research Integrity Officers: http://www.enrio.eu/)
- Singapore Declaration (2010), Netherlands Code of Conduct for Research Integrity, 2018;
 The European Code of Conduct for Research Integrity (ALLEA, new version, 2017)
- Resources: http://www.enrio.eu/resources/?cat=3



Major challenge: differences among disciplines

- The reproducibility challenge
- Plagiarism and all that: how do we see our relationships to data, bibliography, state of the art?
- There cannot be all-purpose recommendations—research integrity is a matter of how we interact with research material and peers on an everyday basis.



Identification of risks: finding out the right attitude

- Risks usually occur when interactions (of all types) are difficult.
- We may not be aware of these difficulties.
- Vigilance and dialogue as major ingredients of risk avoiding.
- Reflexive open science practices are a useful tool, but no magic wand.

Scientific publishing market



Accessibility is a problem



2 million articles

Transparency is a problem

Retraction—Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19: a multinational registry analysis

Mandeep R Mehra 🖾 🛛 Frank Ruschitzka 🛛 Amit N Patel

Published: June 05, 2020 • DOI: https://doi.org/10.1016/S0140-6736(20)31324-6 • 🖲 Check for updates

After publication of our *Lancet* Article,¹ several concerns were raised with respect to the veracity of the data and analyses conducted by Surgisphere Corporation and its founder and our co-author, Sapan Desai, in our publication. We launched an independent thirdparty peer review of Surgisphere with the consent of Sapan Desai to evaluate the origination of the database elements, to confirm the completeness of the database, and to replicate the analyses presented in the paper.

Linked Articles

Reference

Article Info

The Lancet

retraction

Our independent peer reviewers informed us that Surgisphere would not transfer the full dataset, client contracts, and the full ISO audit report to their servers for analysis as such transfer would violate client agreements and confidentiality requirements. As such, our reviewers were not able to conduct an independent and private peer review and therefore notified us of their withdrawal from the peer-review process.

• View related content for this article

We always aspire to perform our research in accordance with the highest ethical and professional guidelines. We can never forget the responsibility we have as researchers to scrupulously ensure that we rely on data sources that adhere to our high standards. Based on this development, we can no longer vouch for the veracity of the primary data sources. Due to this unfortunate development, the authors request that the paper be retracted. Is there a reproducibility crisis in science?

Reproducibility is a problem

HAVE YOU FAILED TO REPRODUCE AN EXPERIMENT?

Most scientists have experienced failure to reproduce results.



https://www-nature-com.pros.lib.unimi.it/news/1-500-scientists-lift-the-lid-onreproducibility-1.19970



It is the peculiar and perpetual error of the human understanding to be more moved and excited by affirmatives than by negatives

Francis Bacon Novum organon (1620)

Distrust

Early report

Ileal-lymphoid-nodular hyperplasia, non-specific colitis, and pervasive developmental disorder in children

A J Wakefield, S H Murch, A Anthony, J Linnell, D M Casson, M Malik, M Benelowitz, A P Dhillon, M A Thomson, P Harvey, A Valentine, S E Davies, J A Walker Smith

> Introduction We saw several children who, after a pa

Summary

Background We investigated a consecutive series of children with chronic enterocolitis and regressive developmental disorder.

Methods 12 children imean age 6 years (range 3-10), 11 boys) were referred to a paediatric gastroenterology unit with a history of normal development followed by loss of acquired skills, including language, together with diantona and abdominal pain. Children underword gastroenterological, neurological, and developmental assessment and review of developmental records. Descoloroscopy and biopsy sampling, magnetic resonance imaging (MRI), electroencephalography (EEG), and lumbar puncture were done under sedation. Barium follow through radiography was done where possible. Biochemical, haematological, and immunological profiles were examined.

Findings Onset of behavioural symptoms was associated by the parents, with measles, murps, and rul speciation in eight of the 12 children, with measure intention in one ohild and othis media in and - A1 children had intestinal abnormalities lymphoid resolutar hyperplassia to Histology showed patchy chronic infla orplasia in in 11 children and reactive lies seven, but no granulomas. 8 oural di schaded. autism (nine), disintegrating (Innet) inible. motivital or vancinal en These were no. focal neurological at minister an and FFG tests. were oversid, Alteraboveratives we had e significantly raised uninary acid compared with agematched cor moglobin in four children. IgA in

ociated gastrointestinal regression in a group of which was generally associated possible environmental triggers. 151: 637-41 Lancet 195

See Commentary page

Inflammatory Browni Disease Study Crown, University Departments of Modeline and Histopathology (A J Wakefield mcs, A Anthony vs. J Linnell rue, A P Dhilton unchan, S E Dealers Micrus) and the University Departments of Paediatric Gastsoenteeology (S.H.Murch see, D.M.Casson secr., M.Malik seco U.A. Thursday start, J.A. Walker Smith (mar.), Child and Adelencent Psychiatry (M Reveloants recruice), Neurology (P Harvey recr), and Radialogy (A Valentine ment), Reput Free Neepital and School of Medicine, Lendon NW3 200, UK Commondance for Dr & Ultrainfield

normality, lost acquired skills, inclu They all had gastrointesting abdominal nain, diambons, an cases, food intolerance. We and gastesintestinal feature Patients and m 17 children on blogting and ted. All children were admitted i by their parents nuck hints including Actual, of immunication

and in it.fee a diseases, and assessed the children. Is as obtained by the senior clinician (JW metchight mataments were Asso and (P91, Mill) with HMS-4 criteria.' Developme uncluded a terriew of prospective developmental re-ents, health visitors, and seneral practitioners, I children did not undergo prechiattic assessment in hospita had been assessed professionally elsewhere, so these as every used as the basis for their behavioural diagnosis. After bowel preparation, descelonoscopy was perfor SHM or MAT under sodation with midatolum and pothida Paired fouren and formalin-fixed macoual biopor samples were taken from the terminal ileum; ascending, transverse, descending, and sigmoid colons, and from the rectam. The executions was recorded by video or still images, and were compared with images of the previous seven consocutive paediatric colonoscopies (four normal colonescopies and three on children with adversation codition in which the observices reported normal appearances in the terminal deam. Bariam follow-through radiography was possible in some cases. Also under solation, cercheil magnetic-resonance imaging (MRI), electroencephalography (IEEG) including visual, brain stem auditory, and sensety evoked potentials (where compliance

Coping with Chaos: How Disordered Then Contexts Promote Stereotyping

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dren, the onset of behavioural problems d, either by the parents or by the child's measles, mumps, and rubella vaccination. in early adverse reaction to immunisation lirium; and, in three cases, convulsions). hildren the average interval from exposure ural symptoms was 6/3 days (range 1-14).

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Holulughid findings

had received monovalent months, after which his rived a dose of meades, momps, and age 4-5 years, the day after which his a striking deterioration in his behaviour with the immunisation. Child nine mumps, and robella vaccine at 10 onthis he developed recurrent antibioticlia and the first behavioural symptoms, st in his sibling and lack of play. arises the neuropsychiatric diagnoses, spitating events; onset of behavioural

errores are see of orner of both behaviour and bowel symptoms.

Laboratory tests

All children were antiendomyseal-antibody negative and common enteric pathegens were not identified by culture, microscopy, or serology. Uninary methylmatonic-acid excretion was significantly raised in all eight children who



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Recall: a definition of open science

Open Science is the practice of science in such a way that others can **collaborate** and **contribute**, where research data, lab notes and other research processes are **freely available**, under terms that enable **reuse**, **redistribution and reproduction** of the research and its underlying data and methods

Accessibility

Transparency

Reproducibility



Components of Open Science



Open Science fosters research integrity and trust

- FAIR principles enhance integrity
- Open Science for more accessibility and transparency
- Data sharing favors reproducibility

4 EU+ UNESCO Recommendation November 2021



'Building on the essentials principles of academic freedom, research integrity and scientific excellence, open science sets a new paradigm that integrates into the scientific enterprise practices for reproducibility, transparency, sharing and collaboration resulting from the increased opening of scientific contents, tools and processes' (Definition of open science)



Is Open Science a condition for quality?

- Openness does not guarantee quality
- Openness is not relevant for all disciplines
- Some research outputs can be closed and efficient



Does Open Science guarantee full integrity?





What about research assessment?

- Publish or perish
- Impact factor vs quality
- Concurrence



Towards new research assessment principles

From San Francisco (DORA) to Hong Kong (Principes)



What is DORA?

Let's change what we value in research.



The Declaration on Research Assessment (DORA) recognizes the need to improve the ways in which researchers and the outputs of scholarly research are evaluated.



The Hong Kong Principles for Assessing Researchers: Fostering Research Integrity (2019)

- 1. Assess researchers on **responsible practices** from conception to delivery, including the development of the research idea, research design, methodology, execution and effective dissemination.
- 2. Value the accurate and transparent reporting of all research, regardless of the results.
- 3. Value the practices of open science (open research) such as open methods, materials and data.
- **4.** Value a broad range of research and scholarship, such as **replication**, innovation, translation, synthesis, and meta-research.
- 5. Value a range of other contributions to responsible research and scholarly activity, such as peer review for grants and publications, mentoring, outreach, and knowledge exchange.



How can we reach integrity and openness?

- Cultural change
 - Slow science
 - Negative results



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