



Handling Ethics Dumping and Neo-Colonial Research: From the Laboratory to the Academic Literature

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Abstract This paper explores that the topic of ethics dumping (ED), its causes and potential remedies. In ED, the weaknesses or gaps in ethics policies and systems of lower income countries are intentionally exploited for intellectual or financial gains through research and publishing by higher income countries with a more stringent or complex ethical infrastructure in which such research and publishing practices would not be permitted. Several examples are provided. Possible ED needs to be evaluated before research takes place, and detected prior to publication as an academic paper, because it might lead to a collaborative effort between a wealthier country with restrictive ethical policies and a less wealthy country with more permissive policies. Consequently, if that collaboration ultimately results in an academic paper, there are ethical ramifications of ED to scholarly communication. Institutional review board approval is central to avoid ED-based collaborations. Blind trust and goodwill alone cannot eliminate the exploitation of indigenous or “vulnerable” populations’ intellect and resources. Combining community-based participatory research using clear codes of research conduct and a simple but robust verification system in academic publishing may reduce the risks of ED-based research from being published.

Keywords Bioethics · Codes of conduct · Collaboration · Colonial science · Community-based participatory research · Equality and equity · Globalized research · Helicopter research · Ill gains · Morality · Neocolonial science · Policy · Predatory publishing · Retraction

Introduction

Ethics dumping (ED), a term that was coined by the European Commission and used in their 2014–2015 Horizon 2020 work programme (European Commission 2019), refers specifically to the “dumping of non-ethical practices to non-EU countries” (European Commission 2015). Since 2013, the European Union (EU) has banned funding to EU projects that engage in ED (Nordling 2018a). ED is defined in this paper as the inequitable or unjust use or possession, or the theft of human, financial, experimental, institutional or other material or intellectual resources of a low-income country (LIC). ED is compounded by the exploitation of weaknesses in ethical knowledge or a resource-poor infrastructure of a LIC for intellectual, financial, or other gains and the absence of, or weak, informed vigilance by appointed guardians of ethical standards such as research ethics committees (RECs) or journal editors (Schroeder et al. 2018, 2019). When there is pressure to be productive in research and publishing, the risk of ED rises, but ED can also be driven by power differentials, patronizing conduct, such as a false belief of superiority by the high-income country (HIC), inequitable

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and unfair distribution of burdens and benefits, cultural insensitivity, double ethical standards, or the lack of due diligence and transparency (Schroeder et al. 2021).

Exploitation could be by another LIC, by a low- and middle-income country (St. Fleur and Schwartz 2019), or by a HIC, the latter being the most frequent. In the published literature, readers might also encounter synonymous terms for ED, such as colonial, neocolonial, parasitic, parachute, helicopter or safari science or research (Dahdouh-Guebas et al. 2003; Molero-Mesa 2006; Boshoff 2009; Bockarie et al. 2018; Nordling 2018b; Minasny et al. 2020; Stefanoudis et al. 2021).

Given that research and publishing is global, academics in LICs might feel pressured to compete with academics in HICs with a stronger financial and research infrastructure and be tempted to “adjust” their ethical research and publishing parameters in order to obtain gains via HICs. The asymmetry in values, ethics, and opportunities between LICs and HICs is not a simple North versus South or post-colonialism paradigm, but may emerge from differences in bioethics policies or the constitution of RECs (Andrade-Narvaez 2020). The abuse of ethical norms in HICs, and experiments that would otherwise most likely never be allowed to be performed in HICs, may involve research, such as clinical trials, that involve “vulnerable” individuals, human populations, or animals (primate and non-primate) where approval from a REC or institutional review board (IRB) in a LIC is obtained, but that could otherwise not be obtained from a REC or IRB in a HIC due to excessively low ethical standards in LICs or incompatibility with high standards in HICs (Chatfield and Morton 2018; Schroeder et al. 2018; Germán and Bernabe 2019). Researchers in LICs that are concerned about being abused, intellectually or otherwise, might find useful advice in the following resources: Tauali’i et al. (2014), European Commission (2015), Garrison et al. (2019), and Hudson et al. (2020).

Examples of Ethics Dumping

Corporate interests in HICs might drive ED-based research by seeking to test programmes in LICs, such as genetically modified (GM) crops (Pua et al. 2019) including fruit and other foods (van Niekerk and Wynberg 2018), GM mosquitoes to fight malaria (Bassey-Orovwuje, Thomas, and Wakeford 2019; Doshi 2020; Famakinde 2020), or GM technologies to control

parasites (Du et al. 2021). The implementation of project goals might include “good for humanity” propaganda to gain public support or financing in HICs, but might involve ED to achieve those goals (Bassey-Orovwuje, Thomas, and Wakeford 2019). ED may take the form of understating ethical risks (e.g., environmental, food, health) while overemphasizing short-term benefits (Bassey-Orovwuje, Thomas, and Wakeford 2019). Modest sustainable development goals that are hidden behind large corporate profits, as sometimes occurs in the pharmaceutical industry, may reduce trust by LIC partners in LIC-HIC collaborations (Leisinger and Chatfield 2019).

The exploitation of LICs by HICs may involve an imbalance of wealth, with excessive returns to the latter while offering piecemeal financial handouts to the former. To address this issue, Saleh et al. (2020), using a United Kingdom–Malawi (HIC-LIC) health collaboration, suggested a payout equivalent to ten times the minimum wage, which in Malawi was approximately US\$1.30 per day, as financial compensation to LIC participants, in addition to other structural community support measures. An example of community compensation is the case of the Samoan Mamala tree, used as an antiviral, in which the people of Samoa received fifty per cent of royalties from use of the genetic information (Berkeley Lab 2004). In cases of financial remuneration, especially where the disparity between minimum wage in the LIC and HIC may be large, there is a risk of excessive or over-compensation (Chi et al. 2022).

Bioinformatics-derived genome-based data and codes that can be used in genetic transformation or gene editing tools, like clustered regularly interspaced short palindromic repeats (CRISPR), might rely on the exploitation of microbial, animal, or human subjects in LICs, or involve testing in LICs that would otherwise be impossible to conduct in HICs (Dryzek et al. 2020; Hudson et al. 2020). From among 106 surveyed countries, 96 had policies or regulations pertaining to the genome editing of early-stage human embryos, gametes, or their precursor cells with the purpose of genetic modification, but regulations varied considerably among those nations for in vitro embryo research (Baylis et al. 2020). Pre-implantation embryonic genetic interventions have complex ethical and legal parameters that must also be considered (Lau 2019). To avoid biopiracy by HICs and to iron out possible inequalities in data sets, one way is to allow data sharing and open data policies, such as those established by the Nagoya Protocol (Ambler et al. 2021).

These offer returns and benefit sharing (Schroeder 2020) to indigenous communities that are used as research subjects, such as San individuals in Southern Africa (Chennels and Steenkamp 2018). Incidentally, the San expressed their desire for additional research in this area to be conducted (Callaway 2017). To protect the privacy of participants and data, and the responsible use and dissemination of personal information, data transfer agreements related to a project's data sharing policies need to be implemented (Mahomed, Loots, and Staunton 2022). Community-based participatory research (Appiah 2020) has allowed researchers in HICs to derive academic publications of “high impact”, bringing them greater repute and thus funding (Schuster et al. 2010). This suggests that the current publishing ethical guidelines or editorial verification systems may be insufficiently prepared to deal with ED-based research and publishing.

In biobanking and genomic research in LICs, the issues of participant autonomy, consent withdrawal, ownership of samples and data, privacy and confidentiality, and benefit sharing need to be constantly weighed and evaluated (Martin et al. 2018; Yakubu et al. 2018; Yakubu, Munung, and de Vries 2019). One limitation of such protocols is that they tend to be established in HICs, providing some trickle-down benefits to LICs, so greater transparency about gains to both LICs and HICs is required to ensure that implementation of such protocols is fair and equitable (Nembaware et al. 2019). Strict benefit-sharing protocols in genomic and health research at micro-, meso- and macro-levels would iron out unfair or inequitable HIC-LIC collaborations (Bedeker et al. 2022). Issues arise when informed consent clauses are opaque, unclear, or offer inequitable returns (Ngwenya et al. 2020). Even though genomic data should be shared with indigenous populations from which they were derived (Hudson et al. 2020) and the sovereignty of those rights should be recognized (Garrison et al. 2019), donor populations in LICs might not be able to use that data if they do not have the research or technological infrastructure to assess complex data sets. Absent robust ethical guidelines, there is a risk of the commercialization and commodification of biomaterials and data in biobanks by funders (Maseme 2021).

A few regional cases of ED are highlighted next to better appreciate how abuses might occur. Ilardo et al. (2018) studied the Bajau tribe of Indonesia, finding that these “sea nomads” had larger spleens, allowing them to dive deeper and longer. That research was criticized by

Rochmyaningsih (2018), who claimed that it benefitted international researchers at the expense of Indonesian scientists, with no benefit to the Bajau tribe. In Guinea, India and Argentina, HIC-based ethics policies tend to guide LIC-based health policies, such as for the Ebola virus (West Africa) and the Zika virus (Latin America) (Vaz, Palmero, and Nyangulu 2019). In Kenya, there is increasing awareness among RECs about the risks of ED via the abuse of local underdeveloped governance to exploit researchers in LICs (Chatfield et al. 2021). In New Zealand, policies and practices are in place to ensure that the rights of Māori are upheld in all aspects of research (Hudson et al. 2010). With respect to the Māori, scientific representation of genetic research on the warrior gene has shown poor cultural sensitivity, suggesting poor community engagement and a lack of scientific rigour, while the national research guidelines of Canada, New Zealand, Australia, and the United States for the use of human subjects, including indigenous people, for research have weak or underdeveloped aspects, including those related to community engagement, rights and interests, institutional responsibilities, and ethical or regulatory oversight (Garrison et al. 2019).

Therefore, alternative equitable but practical solutions to fairness are needed to avoid ED at the research stage. Where artificial intelligence is used, ethics still lacks global consensus and an inability to detach from colonial history and its association with imbalances in power ownership, making it difficult to establish equitable LIC-HIC collaborations that still need a decolonial approach for LIC empowerment (Mohamed, Png, and Isaac 2020; Hickok 2021).

Additional Drivers of Ethics Dumping

ED might involve the abuse of humans, finances, communities, or rights. Women's rights, including of sex workers, need to be respected and protected in terms of both sex (biological) and gender (cultural). This applies to research conducted to understand HIV/AIDS and other sexually transmitted diseases, and to understand cervical cancer (Paul 2018; Cook 2020) or the use of uterine lavage (Pennings 2020).

In times of weakness, volatility, fragility, and disasters (O'Mathúna 2020), such as disease epidemics like the Ebola virus or the current COVID-19 pandemic, “vulnerable” populations such as sick, weak, or

financially distraught individuals in LICs may be prone to exploitation by researchers in HICs (Kelley et al. 2020; Singh et al. 2021). Trusts, corporations, and philanthropic organizations that offer charitable donations while seeking medical solutions in LICs may exclusively bring wealth to companies in HICs (Nembaware et al. 2020; Tangwa and Munung 2020), so greater transparency of their operations in LICs is needed. Access to online data should occur within a strict ethical and legal framework that protects the rights and privacy of patients, including prior informed consent (PIC) (Andanda 2020; Kumar and Muthuswamy 2020) to reduce ethical research- and publishing-related abuses and negative reputational consequences, including retractions, for example as a result of editorial oversight and lack of rigour in screening raw COVID-19-related data (Teixeira da Silva, Bornemann-Cimenti, and Tsigaris 2021). There are currently no regulations pertaining to the collection of data via online platforms or social media in a transnational, including LIC-HIC, setting (Bamdad, Finaughty, and Johns 2022). Strict regulation is also needed to prevent abuses in clinical trials, for example in India, where government abuses are somewhat stymied by the vigilance of civil society organizations (Sariola et al. 2018).

Ethical Challenges in Academic Publishing Related to Ethics Dumping

In published papers, it is suggested that PIC obtained from subjects in LICs should be published as an open access document, in a de-identified format, as a supplement to the main paper. There should not be blind trust in claims of the existence of a PIC. If this simple strategy is followed, it might increase accountability of both parties (LIC and HIC) (Hudson et al. 2020). If differences in policies between collaborating LICs and HICs exist, then these need to be clearly indicated in published papers (Baylis et al. 2020). Any pertinent approvals such as those from IRBs, RECs, or research ethics boards (REBs) (Carpentier and McGillivray 2020) and those of de-identified subjects, including approval numbers and dates, could be appended to manuscripts as supplementary files, and should not be confidential documents that lie exclusively in the hands of editors or publishers. Making such documents open would allow for maximum transparency and accountability. Fairness, care, respect, and honesty are all noble

characteristics and suggestions for establishing ethical and equitable research collaborations between LICs and HICs (Schroeder et al. 2019). However, these aspects can be easily faked, cheated, and manipulated if in the wrong hands (Resnik 2015; Teixeira da Silva 2017). Editors and publishers are in a key position to ensure that there is data verification and proper ethics approval and compliance before a paper is published (Teixeira da Silva, Bornemann-Cimenti, and Tsigaris 2021). Equitable authorship and recognition can only be achieved in a LIC-HIC collaboration through skill-based capacity building, so scholarly communication must reflect ethical authorship standards, avoid guest and ghost authorship, and fairly recognize co-author status (Teixeira da Silva and Dobránszki 2016; Teixeira da Silva 2021a).

Reviewers and editors need to understand and be able to critically evaluate IRB approval, especially for age-, sex- and gender-sensitive subjects such as women and children (Alderson and Morrow 2020; Cook 2020). IRB itself requires that ethics committee members not only recognize established ethics principles (Morris and Morris 2016) and engage in problem-solving, especially with younger or novice IRB applicants (Dicks et al. 2020), but also serve as witnesses of the ethics of the research and not merely as passive individuals that provide the bureaucratic stamp of approval (Douglas-Jones 2021). Paediatric research that involves minors, especially in LICs (Morrow 2012), has legal frameworks that are set within a context of protection and care (Oates 2020). Moreover, in countries or societies where adults or communities claim the rights to decide for children, for example in a HIC (Gillam 2016), the views and choices of children in a LIC must be heard and respected, and not simply overridden.

One example is provided about how ED-based research can infiltrate into the published literature. There was a lack of approval by the San population for publication of their genomic make-up in a ground-breaking study in *Nature* (Schuster et al. 2010). That paper conferred fame and much intellectual credit, such as citations, to the researchers in HICs, but did not fully respect the source of the data, or cultural and ethnic sensitivities, and there was also failure to obtain necessary community approval for publication, ultimately not providing fair recognition to the LIC researchers (Chennels and Steenkamp 2018). In fact, that paper (Schuster et al. 2010) had multiple IRB approvals and an acknowledgement to the San communities, but despite the concerns raised by Chennels and Steenkamp (2018), it was

neither corrected nor retracted. However, a silver lining to that debate was the establishment of the San Code of Research Ethics that requires all researchers in LICs, HICs or elsewhere to abide by more specific requirements prior to research on the San population (TRUST 2019). Empowered by global attention and focus on their human and indigenous rights, the San are now fighting legal battles to reclaim territory that was once in the hands of their ancestors (Hitchcock 2020). Separately, pressure was placed on the Wellcome Sanger Institute in the United Kingdom for the use of a gene chip that employed the DNA of African subjects without proper approval (Stockstad 2019), suggesting that the issues related to ED and violation of indigenous rights now encompasses research and publishing territory.

If the research or ethical community resists the adaptation to a new way of thinking that encompasses stricter vigilant measures for LIC-HIC collaborations, then this may require moral re-engineering (Van den Heever and Jones 2019) or substitution of the status quo (Cooley 2020). Such steps would allow a new and more equitable mindset to be established that is fair and reciprocal (de Vries 2020) and would ultimately benefit LIC researchers. Resource scarcity is particularly acute in Africa, where academics face not only a challenge from resource limitations (Amugune and Otieno-Omutoko 2019) but also in publishing, where resource-derived intellect and output often vie, in a “publish and perish” environment, for a place in competitive and expensive open access venues (Teixeira da Silva et al. 2019a), and where both LIC and HIC collaborators face exploitative and predatory publishing practices (Teixeira da Silva et al. 2019b). For a collaboration to be equitable, it must also ensure equality (Hendricks and Donnir 2019), and publishing provides one viable possibility for this to be achieved, in which the production of an academic paper confers reward and prestige, and provides intellectual equality, even in a resource-minimalist setting. Although simple long-distance email or online-based techniques can be used to achieve an objective such as mental health research capacity-building (Mathai et al. 2019), and since there is a considerable divide between the health and mental health infrastructures in LICs and HICs (Palk and Stein 2020; Palk et al. 2020), great care and caution are needed for the online collection of data, for example via social media (Bamdad, Finaughty, and Johns 2022).

When establishing a new set of values that attempt to combine different ethical standards, and while seeking

integrity (Nortjé and Hoffmann 2019; Roets and Molapo 2019), in addition to the risk of ED (Tiffin 2018, 2019), there are additional challenges and risks such as ethical shopping (i.e., trying to identify the best and most appropriate or comprehensive ethical guidelines, but at the risk of settling for “bargains” of lower quality), ethics-washing (i.e., giving the impression of research being more ethical than it really is), ethical shirking (i.e., lowering the commitments to ethical values while seeking the same returns), and ethics lobbying by conflicted ethics groups that might attempt to legitimize their sets of ethics through political or other means (Floridi 2019). Independent of the country or field of study, the ability to offer equitable social benefits, alongside strict ethical research and publishing norms embedded in scientific integrity, i.e., fortified research literacy (St. Fleur and Schwartz 2019), may reduce the possibility of ED and maximize mutual benefits such as local empowerment (Marwick et al. 2020). There is still a long way to go. For example, while genomic research in South Africa pertaining to human subjects, including indigenous populations, has a fairly robust set of research-based regulations that are set in law (Yakubu et al. 2018; de Vries and Munung 2019; Tindana et al. 2019; Yakubu, Munung, and de Vries 2019), it is unclear if such protections are offered for other fields of research.

For these reasons, editors must carefully and strictly screen papers that involve LIC-HIC collaborations, and verify IRBs, as is expanded upon later in this paper.

Do Common Publishing Guidelines Address Indigenous Rights and Sovereignty?

Biomedical research seems to be better prepared than other fields of research in terms of the range of ethical requirements for research and publishing that have been implemented in a bid to minimize unethical research from being published. This is evidenced by various Committee on Publication Ethics (COPE) guidelines (COPE 2022) and the International Committee of Medical Journal Editors (ICMJE) recommendations (ICMJE 2022), which are likely the most commonly employed ethics guidelines in academic publishing globally. Despite this, an examination of the COPE and ICMJE guidelines reveals that the rights and sovereignty of indigenous populations are not specifically discussed, nor are they offered any protections, while the terms “vulnerable,” “indigenous,” or “ethics dumping”

cannot not be found in these guidelines. Incidentally, the COPE and ICMJE ethics guidelines also fail to deal with the ethics of sting operations (Teixeira da Silva 2021b), which can affect researchers in LICs and HICs.

Rakotsoane and Nicolaidis (2019), as well as Segalo and Molobela (2019), offer valid and passionate arguments why Africa (and by extension LICs) need to move away from westernized or EU/US-centric ethics values (research and publishing) and establish a local “Africanized” version of such value and ethics systems that better suits local and indigenous realities. Ironically, these authors seem to have missed, or misunderstood, that the most powerful and/or influential publishers, and by association, journals, are based on precisely the same westernized or EU/US-centric ethics values (as invoked by organizations like COPE and the ICMJE) that they wish to move away from. Consequently, while their proposals are filled with hope and novelty, they are inconsistent with current global publishing (and research) ethics values that apply to global academia, including in LICs in Africa, somewhat dampening the aspirations of those authors.

Although IRB approval is generally required for research involving human subjects, surprisingly, no guidelines exist (at least not by COPE and the ICMJE) with regards to the use of indigenous populations, or their sovereign resources, for academic research that culminates in an academic paper. Given that the for-profit publishing industry has both exploitative and predatory characteristics (Teixeira da Silva et al. 2019b), it is not surprising that the publishing medium serves as an additional point of exploitation of indigenous rights and sovereignty, simply because there are currently no specific verification or protective measures to offer indigenous populations rights or protections at the publication stage. There is thus a need to stimulate local IRB awareness that covers community engagement, rights and interests, institutional responsibilities, and ethical or regulatory oversight (Lasco, Yu, and Palileo-Villanueva 2021) and that is compatible with international publishing standards, as is suggested next.

Management of Ethics Dumping at the Publication Stage

How can ethics-incompliant research (i.e., from the perspective of a HIC) be conducted in a LIC with the approval of the HIC, or without censure by the HIC, and

then be subsequently published in journals, usually of HIC-based publishers, that claim to follow strict ethical guidelines, such as those by COPE and the ICMJE? Evidently, there are weaknesses or permeabilities in publishing that allow for ED-based research to filter through and be published, escaping peer review and editorial scrutiny. Stopgaps that might prevent ED-based research from filtering through to an academic journal are thus needed. Next, some guidelines for editors are indicated that would allow them to screen a submitted paper to reduce the risk of approving the publication of ED-based research and to prevent abuses of indigenous rights and sovereignty. Four suggestions are proposed that could be adopted by COPE and the ICMJE in their future guidelines. By doing so, these organizations and their guidelines would offer more formal policy-based protection to local HIC participants and their welfare (Rothstein et al. 2022).

First, proof of PIC must be provided as a signed document by the community leader, certifying that they are in a leadership position to sign on behalf of the community.

Second, proof of the non-violation of human rights must be provided as a signed document by the community leader and the authors in which the senior author signs on behalf of all co-authors after they have seen and approved the content. That document certifies that human, cultural, and any other rights have not been violated. In addition, any benefits to both parties (financial, community, intellectual, structural, or other) must be declared and signed by the same signatories. Since privacy may be an issue, especially if “vulnerable” subjects have been researched, the names and identities of those subjects must not be disclosed, while the name and identity of the community leader and responsible researcher or author should be indicated. Since some community leaders might not accept the idea of universal rights (Achebe 2016), any differences that exist between LIC and HIC members of a project must be resolved before the project is executed.

Third, a paper’s ethical statements must conform to national and institutional research and publishing ethics guidelines of all collaborating nations with respect to research of indigenous populations and human subjects. Appropriate and authenticated IRB approval forms should be provided, including the name and identity of individuals or institutional representatives that issued an IRB, in both LICs and HICs.

In these cases, all documents should be appended to a published paper as an open access supplement. This can

be easily achieved, in many cases freely. Where possible, they could also be added to websites such as Zenodo that allow a separate digital object identifier (DOI) to be assigned, for permanency.

Finally, a paper's ethical statements (or a limitations section) must indicate any weaknesses, flaws, or limitations to the protection of indigenous rights and sovereignty, indicating clearly where and what those limitations are, with suggestions on how to overcome such limitations.

These four relatively simple steps and suggestions would, in the author's opinion, fortify accountability. However, it is the responsibility of editors to verify that the documentation that has been submitted as a supplement is valid. Editors would need to contact any related party to verify that such documents are valid or identify if doubts exist, and the peer review of the paper should not begin until all documents have been verified as legitimate. Although this is a key aspect of IRB verification, it might very well be the weak link in the publishing production line. In turn, editors need to operate within established ethics parameters (Dobránszki and Teixeira da Silva 2016). Bodies such as COPE and the ICMJE, which already have global reach and implementation of guidelines, would need to incorporate these steps as policy, following additional consultation and refinement. Consequently, any authors that violate such policies, or any editors that fail to verify or respect them, would be subjected to ethical scrutiny and face sanctions as for any other research- and publishing-related ethical transgression, also according to established COPE and ICMJE ethics guidelines.

Conclusion and Future Perspectives

ED has been gaining attention and traction in the past few years. Within the wider context of research and publishing misconduct, little attention has been paid to the protection of indigenous rights and sovereignty and how to handle the violation of rights in the “end-product” of research (i.e., a publication) that may have employed ED. While some indigenous community guidelines have started to be established (e.g., for the San in Southern Africa) (TRUST 2019) and while national research guidelines for some indigenous communities exist in select countries (e.g., Canada, New Zealand, Australia, and the United States), they are still incomplete (Garrison et al. 2019), requiring additional

fine-scale refinement to ensure rigorous ethical oversight (Ferretti et al. 2021).

Ultimately, like guidelines for ethicists (Teixeira da Silva et al. 2019c) or curriculum vitae (Teixeira da Silva et al. 2020), any guideline that is put in place but that does not have a mechanism for independent, open, public, and transparent verification is only good on paper, but not in practice. In this paper, suggestions and provisional guidelines are proposed for ethics organizations, journals, publishers, and funders, fortifying calls for greater scrutiny and regulation of ethics violations, for example pertaining to the use of biological materials in ED (D'Amato et al. 2020). Such policies need to verify that documentation and approvals are valid before a paper is published and even before peer review begins. However, given that peer review is permeable and that authors can falsify documents and statements, guidelines also need to accommodate the detection of ED-based violations at the post-publication stage (Teixeira da Silva, Al-Khatib, and Dobránszki 2017).

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