U4 Helpdesk Answer

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Overview of corruption in academic research

Corruption in academic research has consequences beyond the academic community. When it happens in medical research or in research upon which policy decisions will be based, it can have devastating effects for the whole community. However, even when the research itself might not have an impact outside of the academic community, corruption in academia can undermine core values in society as it breaks the link between merit and hard work and success, and can make favouritism, bribery and fraud more acceptable to obtain results. The academic culture of "publish or perish" has incentivised unethical behaviour as academics have to produce and publish research constantly to advance in their careers. In low income and low-to-middle-income countries (LMIC), a lack of funding and opportunities further exacerbates the problems.

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Please provide a sector study on corruption in the academic research sector and ways to address it (with focus on low income/LMIC countries in Africa)

Contents

Background

Academic integrity has gained attention in the past decades, particularly as both public funding in the sector in some countries has declined and scandals that range from the falsification of data and results in medical trials to the proliferation of predatory journals has increased.

More attention has been paid to the health sector since research and development in the sector usually involves large amounts of investment and limited oversight, thus providing incentives and opportunities for corruption to flourish (Merkle 2017, 2). In addition, the consequences of corruption and opacity in the health sector can have devastating consequences for patients, prevent public health agencies from making informed decisions, waste public health funds – as it is harder to determine whether a drug's effectiveness justifies its cost – and slow medical progress (Bruckner 2017, 5-6).

In the academic sector, substantial resources and discretion can make higher education a sensitive

MAIN POINTS

— Misconduct can happen at all different stages of research. Favouritism or bribery can determine grant winners or PhD admissions; ghost-writers can be hired by faculty and students alike; data can be falsified to support an expected hypothesis.

— The research environment and the "publish or perish" academic culture can incentivise misconduct in academic research as faculties need to publish new and valuable research constantly.

— Academia is not impervious to more "mundane" types of corruption, and embezzlement and fraud are common risks particularly when academic autonomy becomes synonymous with a lack of oversight and control.

— Low income and LMIC countries confront a particular set of challenges, as a lack of funding and specific barriers can create more incentives for unethical behaviour.

sector for corruption (Constantino 2019). More generally, corruption in academia has detrimental effects to the core values of meritocracy, honest academic research and excellence in teaching and research (Altbach 2004, 8), and can also ruin the reputation of the university or research institution (Kirya 2019, 3). Beyond depriving them of much-needed resources, corruption can threaten "the

legitimacy of universities as knowledge producing and training institutions" (Kirya 2021, 6).

As higher education increasingly becomes a prerequisite for better salaries and access to job opportunities, corruption risks increase (Kirya 2021, 5). According to some estimates, fraud in higher education could be a business worth US$1.5 billion to US$2.5 billion (Redden 2012).

The common expression in academia to "publish or perish" has put a lot of pressure among academics to find a subject and results that are worthy of making it into the best journals of their area of expertise. This pressure can lead to misconduct or questionable ethics (Moosa 2018, 56; Denisova-Schmidt 2017, 8).

As with most unethical or even illegal behaviour, the prevalence of fraud in academic research is not accurately known (Regmi 2011, 74). Nevertheless, corruption types in higher education involve all sorts of activities, from high-level corruption in university management to petty corruption such as academic dishonesty (Kirya 2021, 5). It can take many forms and includes manipulating university admissions (either by influencing academic authorities or outright bribing them), academic posts being sold or given to someone through undue pressure, research being falsified, plagiarism in publications and cheating in examinations (Altbach 2004, 7-8; Kirya 2021; Constantino 2019, 4-5).

In general, the veracity of the data that appears in publications is taken on trust (Tourish & Craig 2020, 175) which means, when academics engage in dishonest activities, they are to a degree abusing an entrusted power.[1] In that sense, research

misconduct can also be viewed as a form of corruption (Tourish & Craig 2020, 174), and corruption in the academic sector can be understood as a lack of academic integrity (Denisova-Schmidt 2017, 2). Universities and research institutions in developing countries can face unique challenges as a consequence of the liberalisation and expansion of the sector (Kirya 2019), and research environments can provide the necessary incentives for individuals to commit research fraud (Tourish & Craig 2020, 175).

The negative consequences of corruption in higher education and research institutions go beyond the academia and have a larger effect on society in general as students and employees "come to believe that personal success comes, not through merit and hard work, but through favouritism, bribery, and fraud" (Chapman & Lindner 2016, 248). This breakdown of core ethical values could undermine civil society if it becomes widely shared (Chapman & Lindner 2016, 248).

Corruption in academic research

Examining the role of organisational settings on individual corruption activities, Tourish & Craig (2020, 175) aver that the institutional pressure to publish can incentivise certain forms of misconduct that in turn can become normalised by the whole organisation. Academic corruption can express itself differently depending both on the activities and the knowledge of those who engage in it. For example, one can distinguish between academic dishonesty (cheating or fraudulent research that goes unnoticed); academic collusion (cheating or

[1] See Transparency International's definition of corruption as "the abuse of entrusted power for private gain".

fraudulent research that has been noticed but is not acted upon); non-monetary corruption (gifts, favours, etc. in exchange for something; cronyism and nepotism); and monetary corruption (bribes) (Denisova-Schmidt 2017, 16).

Similarly, looking into the academic context and its influence on individuals, corruption in academia has been enhanced by four factors:

1. diminishing public funding, which translates into lower salaries and poorer working conditions
2. universities being expected to secure their own budgets
3. universities having more administrative autonomy to secure money, which can lead to less oversight
4. competition for international recognition, which puts pressure on faculty to conduct research that then makes it into top-tier academic journals (Chapman & Lindner 2016, 252-254).

These four factors have also produced a range of pressures on individuals studying or working in these environments that can lead to unethical behaviour (Shaw 2013, 195). Five characteristics can shape this behaviour:

1. excessive competition, to a degree where pressure to perform can lead to faculty acting unethically
2. misalignment of teaching and research, where research has become more important for career promotion, but the teaching workload has not changed
3. disproportionate rewards – rewarding high-impact publication can become an incentive for dishonesty in research
4. injustice in the working environment – if people perceive the allocation of resources as unfair, they are more likely to engage in unethical behaviour
5. concentration of power with insufficient checks and balances, a phenomenon in academia partly driven by the pressure to be efficient and responsive to the market (Shaw 2013, 195-197).

A lack of leadership, or weak leadership, can increase the risks of corruption and allow it to entrench itself in the institution (Altbach 2004, 8), and any corruption risk is likely to be amplified if the research organisation is operating in a context of lax financial governance and a lack of transparency and accountability (Merkle 2017, 2).

A problem arises when individual researchers might not conceive of their actions as wrongdoing, particularly if they believe such practices are widespread leading to a "contagion effect" inside the academic community (Tourish & Craig 2020, 175-176). This is probably more likely in certain types of corruption, like bribing a ghost-writer for a publication; demanding bribes from service suppliers; nepotism in supervision, admission or in choosing service providers (Denisova-Schmidt 2017, 2-4; Kirya 2021; Constantino 2019, 4) than in more obvious cases of corruption, like embezzlement.

The type of research being conducted, whether it is private or public, and the research aims can influence the corruption risks. Similarly, the context in which the research takes place compounds the corruption risks. In a country where corruption is more prevalent, risks might extend well beyond the scope of the research and include more "typical" forms of corruption such as embezzlement.

Private interests financing research can lead to a severe conflict of interest. This is particularly worrisome in the development of health products,

mainly medicines, which need to undergo several trials before being released to the market. At this stage, pharmaceutical companies interact with contract research organisations and trial participants (Petkov & Cohen 2016, 10). This interaction can create conflicts of interest as companies fund researchers and organisations. Companies want the results of the studies and randomised controlled trials to show their products as effective. Additionally, the researchers might also have dedicated their careers to a particular area and thus want to also show positive results (Petkov & Cohen 2016, 10). If any of these actors cherry pick what to report to show the product in a better light, this could be regarded as an abuse of

power for private gain (Petkov & Cohen 2016, 10). For its part, the scandal of Cambridge Analytica showed how the use of data allegedly collected for academic purposes can be then misused for commercial and political ones without the subjects of the breach knowing the final destiny of their information (Rosenberg et al. 2018).

Specific corruption risks

The following table can provide a succinct overview of some of the types of corruption one can find in academic research (based on Kirya 2021, 8):

Types of corruption

Political corruption	Academic fraud & cheating	Sextortion & sexual harassment	Administrative & bureaucratic corruption
• Diversion of budgets • Political involvement in research affairs, including employment • Awarding unearned PhD degrees or research grants to politicians, their relatives and cronies	• Plagiarism • Research and papers mills • Falsification of data and research results • Fake journals and peer reviews • Impersonation • Bribe-influenced alteration of marks • Degree mills/certificate forgery	• Extorting sexual acts in exchange for employment or academic outcome	• Corruption in the selection of students or grant recipients • Corruption in management • Nepotism and favouritism in the appointment and promotion of staff • Staff absenteeism • Embezzlement of funds • Fraud in procurement

There are different stages of academic research where and when corruption risks can occur. As the "value chain of research" can be quite different from discipline to discipline, there are some common features of academic research:

- admission or selection of students
- proposal development and grant application
- once funds are secured, an actual research design with responsibilities and a more accurate timetable is developed
- hiring of staff as well as securing a laboratory or other facilities, equipment, and software necessary to conduct the proposed research
- collection of data, usually by junior staff or students, with supervision from senior researchers
- data analysis, which usually includes senior researchers depending on the research type and complexity of the analysis
- result systematisation or reporting
- publication or presentation of the final results

Integrity risks at the admission or selection stage

University administrations can engage in several activities that violate academic integrity, like selling admissions and creating degree mills (printing out degrees for people who have not really fulfilled any academic requisites or recognising work experience as counting towards an academic degree) (Denisova-Schmidt 2017, 7; Kirya 2021, 15). The selection of research grant winners, PhD admissions and scholarships can be especially non-transparent, and there can be a previous agreement of who will win an "open" tender, whether for nepotism and favouritism or bribes (Denisova-Schmidt 2017, 3; Kirya 2021, 11). In Russia, an investigation found bribes were facilitating admission processes, and even a dean was

suspected of accepting a bribe for a PhD admission (Mohamedbhai 2015).

Another corruption risk can come from the applicant side as different university representatives mentioned in a 2012 conference that they had received prospective students' applications with identical recommendation letters (Redden 2012), which may suggest fraudulent acquisition of the letter or misrepresentation of the candidate's academic merits or proficiency. Research institutions or universities could also gain their accreditation through bribery (Kirya 2021, 10) and funding partners should take this into consideration when evaluating grant applications.

Academic integrity

Students can engage in a number of unethical activities, but a common and widespread practice at the university level is that of cheating. Studies have found that, not surprisingly, students are more likely to adopt a dishonest approach if they either witness others do the same or think that others are cheating (Mathrani et al. 2021; Tatum & Schwartz 2017, 131). Cheating is a form of academic misconduct, but it can also entail either the outright corruption of faculty, through offering bribes to pass exams or other advantages, or faculty turning a blind eye and thus enabling an environment of misconduct. Finally, presenting others work as one's own is also a form of cheating, and if the work is acquired by abusing the position one occupies it can also be seen as a form of corruption. For example, a peer reviewer for the Annals of Internal Medicine rejected a paper that he then submitted to another journal and was published under his name (Dyer 2016).

Both students and faculty can turn to ghost-writing, paying others to write their research or

dissertation. Although not necessarily a form of corruption (unless ghost-writing is accomplished by abusing power; for example, a researcher using their rank to get a PhD student to write a paper for them), ghost-writing implies ethical misconduct as it passes someone else's work off as one's own. If, as a result, one gets a promotion or a scholarship, meritocracy is also compromised.

This practice has been on the rise in the past decade (Kirya 2021, 14) as ghost-writing services can be easily contracted online (Grieger 2007) and the authorship of entire papers can be purchased (Ganley 2020). Even where access to the internet is difficult, these services can be purchased offline (Kirya 2019, 14). Ghost-writing is harder to detect than plagiarism or the recycling of a paper, both practices easier to detect by software, like Turnitin.

Academic integrity can be further be compromised when faculty decides to look the other way when students or colleagues engage in non-ethical activities (Denisova-Schmidt 2017, 8).

Research design

Researchers can deliberately design the research to find results that will support what they want to find (Petkov & Cohen 2016, 11). They can also provide only incomplete or even incorrect information regarding the research procedures, making replication difficult or impossible (Moosa 2018, 58). At this stage, researchers should address issues like what checks will be used to find invalid values, inconsistent responses and incomplete records as well as how the project will be documented to avoid subsequent risks of misconduct. From the very beginning, it is important to address who owns the data and the research (Regmi 2011, 77). Researchers should be clear in this regard (Regmi 2011, 77). Conflicts of

interest and other pressures will be covered more extensively in the subsection "Undue influence and conflict of interest," but many of the risks relating to those forms of pressure can come at the stage of research design.

Fraud/falsification

Research projects with external funding can be susceptible to integrity issues that compromise the credibility of their findings (Merkle 2017, 2). In particular, medical research can be susceptible to pseudo-trials funded by the drug companies that are seeking one particular result (Vian 2005 in Vian 2008, 85) with sometimes fatal repercussions (Kirya 2021, 14).

But is not only medical research that is susceptible to these risks. There are cases of data fabrication and falsification by researchers and faculty (Moosa 2018, 57-58; Denisova-Schmidt 2017, 8; Ganley 2020) and reports on studies that never occurred (Tourish & Craig 2020, 176). In the book on the academic culture of publishing, Moosa recollects some illustrative cases, including that of a researcher who fabricated more than a decade's worth of data on obesity, menopause and ageing (2018, 57), while a survey showed that almost 10% of journal editors had come across falsified or fabricated data (Hoover & Hopp 2017, 41).

Misrepresenting the data

More subtle ways to rig the data are to conduct the scientific investigation in a manner that does not allow for propositions that could refute the hypotheses to emerge; to carry out an experiment until it produces the desired outcomes; to finish an experiment early once the desired value has been found; or to exclude unfavourable results (Moosa 2018, 58, 66; Tourish & Craig 2020, 176).

Reporting bias leads to only some results from medical trials being published and results that harm commercial interests never make it to the public (Bruckner 2017, 4). Similar reasons can lead to evidence distortion, for instance, when published evidence from medical trials "overstates benefits and downplays harms" by spinning or manipulating the data (Bruckner 2017, 4).

Although this risk is usually higher when corporate funding that expects certain results is involved, it can also happen when researchers are trying to confirm a hypothesis since it can be easier to publish a paper that proves its hypothesis instead of refuting it or one that confirms the journal editor's views (Moosa 2018, 67).

Selling or misusing data

When large databases with individuals' information are constructed, these can be sold to interested parties or used for purposes other than those originally intended with the research. Especially when data is meant to be shared between different researchers or organisations, there is a risk "of violating the contractual and socially agreed terms of data re-use, and thus risks of acting against the reasonable expectations of users" (OECD 2019). The most known example is the Cambridge Analytica scandal, where Facebook users' personal data was used for commercial purposes instead of academic ones (OECD 2019). Similarly, a survey carried out for socio-economic research, can then be sold to a marketing company to use as a base to sell its product. By doing this, researchers are abusing their position and the trust they have received from their subjects and using the data collected for personal gain (whether in the form of a monetary exchange or to gain a subsequent job position in the private company to whom the data was given).

Compromising ethical standards

Thorough and ethical research requires strong ethical conduct. But researchers can cut corners due to time or budget constraints or because they do not deem the guidelines relevant. Misconduct in this regard can take the form of falsifying consent forms; reporting ethical research workshops that never occurred or did not have the proper supervision.

In developing countries, the asymmetry of information can be large, leading to situations where the participants are not thoroughly informed or do not completely understand the clauses for informed consent and similar issues regarding adequate standards (Vian 2005 in Vian 2008, 85; Petkov & Cohen 2016, 10). In clinical trials, the problem can be bigger since, for some poor communities, the trial is their best chance to access treatment and thus are not really giving a fully informed consent to participate (Petkov & Cohen 2016, 10).

Undue influence and conflict of interest

Undue influence can take many forms, from influence trading to grant access or gain advantages (Constantino 2019, 6) to using research money and grants to benefit friends and family through jobs or grants. It can come from political or private actors or from donors.

Government led research can suffer from the lack of independence of the office in charge, threatening the validity of the findings (Rahman 2020, 3). A research institution working for the government or obtaining government funds could be asked not to collect certain data that could paint a critical picture of the government or could be prevented from publishing their results (Rahman 2020, 10).

Similarly, universities can serve to advance someone's agenda and direct it towards a particular audience (Kirya 2021, 9); research institutions, particularly if they already have some standing, could serve a similar purpose. For example, a government can apply pressure for research that provides favourable findings (Moosa 2018, 67).

The political manipulation of data can happen at various stages, from the design to the policymaking stage (Rahman 2020, 12). For example, the research design can be manipulated to only collect data from a certain group and ignore another. Similarly, at the interpretation phase, one explanation might be favoured instead of another for political purposes, or a particular line of query can be completely excluded from the research.

In developing countries, governments or incumbent parties are sometimes involved in the running of universities or research institutes (Kirya 2021, 8) or a government official can become a university rector or the director of a research institution (Denisova-Schmidt 2017, 4) thus further complicating the objectivity of academic research in those places. The risks are not limited to the actions and inactions inside the institution, but universities and research institutions owned or run by the elite or politicians can be subject to less external scrutiny (Kokutse 2018). In Peru, for example, private owners of universities are actively engaged in politics, and have even run for the presidency of the country.

Private interests behind research might try to sway the results in one direction or the other. Interference from commercial interests can result in reporting bias, when certain results are more likely to be published than others (Bruckner 2017, 4) or can also alter the design of the research when, for example,

banks fund research projects that look into the "benefits" of deregulation (Moosa 2018, 67).

Donors may also deliberately or unintentionally have an undue influence over research (Chapman & Lindner 2016, 256). This could be the case if, for example, a research grant is formulated in certain terms and the researchers then feel they need to respond to those particular demands. If researchers feel that their funding comes with some expectations regarding the findings and could lead to future funding opportunities, this could lead to misconduct on their part, especially if researchers are cash-strapped. It could also be outright influence, as with private donors that look for research programmes that further their own agendas. For instance, donations by businessperson Charles Koch to the George Mason University in Virginia, granted the foundation a say in faculty matters (AP 2018) which can easily be translated into research decisions.

In some cases, articles involve a ghost-writer who has contributed to the paper but is not named on it. This often occurs with junior researchers but can also happen to hide an author that has a conflict of interest in the research being presented (Moosa 2018, 70).

Bribes

Bribes can be used for several purposes, from securing the favourable review of a grant or PhD application, to silencing whistleblowers. Bribery can involve researchers as well as other actors, such as universities, journals and the journalists who comment on these issues (Petkov & Cohen 2016, 10). The recent admissions scandals in the US have shown the extent and diverse use of bribes in higher education as wealthy parents used different schemes to get their children into colleges through bribes (Jaschik 2021b; Kirya 2019, 9).

Abuse of power

Abuse of power can occur in a number of ways, and includes nepotism, cronyism, and patronage in allocating resources and giving employment opportunities. Universities can become the extension of political and religious patronage networks, and both academic credentials or student admissions can be given to politicians, their relatives and their cronies (Kirya 2019, 6, 9). Employment and promotion can be based on favours, nepotism and rewards and not on merit (Sida 2021b; Kirya 2021, 12; 2019, 11). Similarly, certain candidates' research projects or travel and conference applications can be unduly favoured for the wrong reasons (Sida 2021b).

Universities with highly politicised environments can increase the risks for the abuse of power and clientelism, as Sida has assessed in the case of Bolivia (Sida 2021b). Scandals regarding "quid pro quo" abound. For instance, the former dean of the School of Social Work at the University of Southern California was recently indicted for receiving contracts from a politician to bring money to the school in exchange for his son to be admitted to a graduate programme with a full scholarship (Jaschik 2021a).

Several types of misconduct can also arise in co-authorship, such as gift authorship (which credits someone who has not truly collaborated to either the research or the final paper). Graduate students may feel obliged to put their supervisors as co-authors. Sometimes researchers may exclude a junior researcher who has done a significant part of the work from authorship. On the other hand, they might include another researcher who was not involved expecting reciprocity (Moosa 2018, 69-70).

Sexual harassment and sextortion

Academia in general, but even more so in developing countries, can be a patriarchal and male dominated environment. This type of environment thus presents gender-related corruption risks, where those in power can take advantage of their positions and engage in gender-based violence, particularly sexual harassment and sextortion.

Sexual harassment and sextortion are part of "different forms of actual and potential forms of gender-based violence residing in higher education system, ranging from bullying and sexist jargon to sexual abuse and rape" (Bondestam & Lundqvist 2020, 398). Bondestam & Lundqvist (2020, 401) find that gender harassment is the most prevalent form of gender-based violence in all disciplines of higher education and being reported by students, doctoral students and staff. In the UK, a website collected anonymous experiences regarding sexual harassment, abuse, assault and misogyny, and the country's top institutions were mentioned several times (BBC 2021).

Intersectionality also plays a role, and groups where the power imbalance are more pronounced, such as younger women, women in insecure employment positions and minorities, are more likely to be targeted by sexual harassment (Bondestam & Lundqvist 2020, 401-402).

Sextortion refers to the extortion of a sexual act in exchange for a "benefit." It is a form of sexual exploitation in which a person abuses their authority to extort an unwanted sexual activity in return for something (IBA 2019, 8). Since sexual harassment is a serious problem in higher education (Kirya 2021, 16; 2019, 12-13; Bondestam & Lundqvist 2020), it can be deduced that sextortion is likely to be a problem in this context, especially due to significant gender disparities. The

gender gap manifests as fewer females in positions of power, creating incentives for sextortion and a risky environment for (especially female) PhD students (Sida 20221b).

Indeed, a survey in the University of Zambia found that female students to perceive more sexual harassment occurring at the university (Menon et al 2009). Similarly, a survey carried out at tertiary education institutions in Taraba State in Nigeria found a prevalence of sexual harassment there and, particularly, that female students "were enticed with high grades for sex" (Onoyase 2019, 81) showing a possibility of sextortion in those institutions. Another study in a state university in Zimbabwe found that sexual harassment of female employees was underreported and quite prevalent (Mapuranga et al. 2015). Study participants were of the view that the prevalence of sexual harassment of mostly female employees by male perpetrators was the culture that "stresses male superiority and female inferiority in social, political and economic issues" (Mapuranga et al. 2015, 28). Worryingly, most victims do not take formal action as they fear victimisation and assume that sexual harassment is normal (Mapuranga et al. 2015, 28).

The consequences of these types of behaviour for the victims are quite serious, and can include ill health, irritation, anger, higher dropout rates and depression, to name just a few (Bondestam & Lundqvist 2020, 404-405).

Misconduct in publication

The "publish or perish" culture by which recognition and career advancement are highly dependent upon publication in academic journals can have negative consequences at this stage. To achieve more publications, some institutions give financial incentives to faculty for publishing, which can have

the unintended consequence of incentivising the submission of fake articles based on manipulated data (Sharma 2017; Kirya 2021, 15).

A clear problem is also that of plagiarism, using someone else's work or ideas and claim them as their own; and self-plagiarism, recycling previous work without recognising it (Moosa 2018, 62; Denisova-Schmidt 2017, 8; Tourish & Craig 2020, 176; Kirya 2021, 13-14). Faculty engaging in citing each other's work to improve citation scores but without any academic necessity is also misconduct (Denisova-Schmidt 2017, 3, 9).

Other problems that arise (and can also be attributed to this academic culture) occur at the peer review stage, when papers sent for review could be disseminated without authorisation (Regmi 2011, 75). Researchers working on similar topics, and thus asked to peer review, can plagiarise the submitted research or fabricate a study based on their results or respond with unfavourable reviews in order to publish their own research in the same topic first (Gross 2006, 700-701; Denisova-Schmidt 2017, 8; Ganley 2020). Although double-blind peer review is intended to reduce personal bias, it can unintentionally make reviewers less accountable (Cohen 2010 cited in Regmi 2011, 76) and can also be abused by the reviewers who can create peer review rings (Denisova-Schmidt 2017, 9).

When fraud or misconduct is identified in a published article, it is crucial that journals retract it, as even retracted articles can continue to be cited (Gross 2016, 703). This becomes more difficult with the proliferation of predatory or fake journals. These journals charge authors fees to publish their work without academic rigour or transparency and lack similar rigour when appointing the journal editors (Sorokowski et al. 2017; Burdick 2017; Kirya 2021,

14). In an experiment conducted by a Polish university, a fake CV was sent to hundreds of journals applying to become an editor. Although the fake profile was inadequate for the role of an editor, 40 predatory journals appointed the fake person as editor without further investigating the profile, some of them asking for a donation or subscription fee or suggesting they could share the profits from the publication fees (Sorokowski et al. 2017).

Embezzlement, theft and misappropriation of funds

Embezzlement is the "misappropriation of property or funds legally entrusted to someone in their formal position as an agent or guardian" (Semrau et al. 2008, 1). Funds, whether big or small, can entail an embezzlement risk. Research grants can be misappropriated in several ways, from duplicate payments, false vouchers or invoices, fake employees, charging for events that did not happen, or "double-dipping" – having duplicate funding without informing the donors (Kirya 2021, 13; 2019, 11-12; Semrau et al 2008; Constantino 2019, 5). Universities can inappropriately charge students who are receiving financial support (Denisova-Schmidt 2017, 4). The former bursar at the City University of New York was recently charged with stealing almost half a million dollars in funds destined for student scholarships and stipends (Whitford 2021).

Additionally, in low income and LMIC countries, research funding can come from international aid. This can present a number of opportunities for corruption related to donor funding. First, if the research project is to be conducted in a constricted timetable, this could mean that large amounts of funds have to be spent quickly, which can lead to poor oversight (Semrau et al. 2008, 2). Second, the use of more than one account, as foreign currency

and local currency accounts are established, adds an extra level of complexity for any tracking system and makes transparency more difficult (Semrau et al. 2008, 2). Additionally, the decentralised management of universities can also make it harder to detect fraud, as the central administration might be unaware of how funds are being administered in a particular department or project (Kirya 2021, 13).

Finally, the risk of theft is higher in contexts where the use of cash is more prevalent and many day-to-day transactions require the use of cash (Semrau et al. 2008, 2). Paired with van Helden's finding that grants usually do not sufficiently cover overhead costs for the institutions to strengthen integrity measures, there is an increased risk of corruption in countries where universities and research institutions have fewer sources (Merkle 2017, 2). Money could be diverted to other activities, whether in the government in general, or inside the university or institution (Kirya 2021, 9).

Professors may sell the textbook copies they receive for free (Davis & Usry 2011; Kirya 2021, 13), which means they could also sell hard-to-come-by equipment and other research resources for profit. Faculty could also develop products through research funds and then sell them privately, or professors could make students buy their own publications (Kirya 2021, 13).

Collusion in procurement

The university or research institution's administration could collude with suppliers (or be bribed by them) and rig bidding processes (Kirya 2021, 13; Constantino 2019, 5). In Uganda, a wall that collapsed at Makerere University raised suspicion regarding the bidding process, as engineering reports "indicated that the

procurement process was not conducted according to agreed procedures" (Karugaba & Olupot 2009).

Because research can entail a number of different providers and services, from scientific equipment companies to online platform providers, there is fertile ground for abuse, including procurement fraud (Sawahel 2020). In the case of requiring highly-specialised equipment for which there are only a very limited number of bidders, the risk of collusion increases (Merkle 2017, 2).

Focus on low income and LMIC countries in Africa

Between the 1980s and 1990s, university enrolments in low income and LMIC countries increased while government support and foreign donor aid to university education decreased, creating a situation of lowering quality that only began to change towards the end of the 90s (Beaudry et al. 2018, 7). To curb corruption risks, universities and research institutes in the global South require ethics review boards and high accounting standards but are less funded than their counterparts in higher income countries (van Helden 2012). The insufficient funding for scientific research in Africa (Kigotho 2021) and low salaries can provide incentives to engage in corrupt practices, particularly if those in charge of handling the money are underpaid.

According to surveys targeting researchers and research coordinators in Africa, the two largest obstacles in quality research in Africa are insufficient funding and poor research infrastructure and equipment (Tijssen & Mbula 2017, 398). Physical, mathematical and chemical sciences are particularly underfunded as Western funding tends to go to health and medical research,

and basic research is not particularly attractive to commercial funding (Marincola & Kariuki 2020, C). Additionally, research in low income and LMIC countries can face a double dilemma: a dearth of domestic funding accompanied by higher research costs as some research equipment could cost two to five times more what it costs in the USA or Europe (van Helden 2012).

In some African contexts, universities have cultures of patronage in recruitment and promotion (Badham-Jones 2014, 4), which appears to be supported by some studies. A survey conducted in two universities in Ghana found that the majority of students perceived favouritism and nepotism as prevailing forms of corruption and that corruption was mostly initiated by the staff (Kuranchie et al. 2014, 193-194). The first lady of Uganda and the former first lady of Zimbabwe were allegedly awarded controversial academic degrees despite not fulfilling the requirements (Kirya 2019, 7).

Common forms of corruption in higher education and research in Rwanda are not dissimilar to the ones covered more generally in the previous section, and include nepotism, bribes, academic dishonesty and requesting sexual favours or money in exchange for grades (Sida 2021a). In Nigeria, corruption is found in several areas of higher education, from the promotion of faculty to the publication of fake journals and falsifying research, and professors making their students buy textbooks they have authored (Mohamedbhai 2015).

In Ethiopia, corruption risks found at the higher education level include nepotism in employment decisions, sextortion, plagiarism and demanding bribes to grant acceptance into PhD programmes (Sida 2021c). Additionally, scientists in the department of chemistry complain about having

difficulties accessing their own research funds (Sida 2021c).

In Uganda, Busoga University behaved as a degree mill, awarding more than a thousand degrees in exchange for a higher fee than their usual tuition to several people that did not meet admission criteria and with shops in a suburb near the university offering ghost-writing services (Kirya 2019, 8, 14). Sexual harassment is also a preoccupation as an investigation found students were being asked for sex in return for marks (Nakkazi 2018).

In Mozambique, a Sida assessment found that corruption risks arose mainly from a lack of good administration and management of research. There was a greater risk of misuse of funds where money has to go through several offices (Sida 2021d). Finally, with increasing funds, it was considered important to engage in more monitoring and auditing to minimise conflicts of interest in the selection of research projects in Mozambique, due to the small size of the scientific community (Sida 2021d).

Risk assessments in countries in the region have also found corruption risks with universities' abilities for internal control and financial management as well as the funds not being used for the intended purpose (Sida 2021a; 2021c; 2021d). Procurement in the universities can also be weak and can mean that international funds are used for expensive travel budgets (business class, expensive hotels, etc.) (Sida 2021a, 2021e). Furthermore, in 2020, the COVID-19 emergency served as an excuse for certain universities to bypass public procurement procedures (Sawahel 2020), thereby exposing themselves to greater risks of corruption.

The perceived level of corruption in a country can have negative consequences on the quality of researchers, both for publishing research and

applying for funding (Merkle 2017, 3). In a survey conducted with 5,700 African researchers, corruption (as a big category) was among the reasons for leaving the country where they work (Beaudry et al. 2018, 115-118). Corruption can thus also be a driver of brain drain, a problem of particular importance for Africa (Beaudry et al. 2018, 7).

African researchers can also face particular barriers to publishing relevant research. These include: the increasing costs of publishing; systemic bias when the researchers are affiliated to institutions unknown to Western peers in charge of judging their work; lack of representation of African researchers as peer reviewers; language and stylistic barriers; and being targeted by predatory publishers (Marincola & Kariuki 2020, B). In collaborations between international agencies from developed countries and African countries, African scientists can be stuck in data collection and laboratory technician positions with no career development plan, whereas their Western colleagues flourish (Nordling 2015).

Finally, relevant stakeholders identified corruption as a significant issue preventing them from conducting pharmaceutical clinical trials in sub-Saharan Africa (Egharevba & Atkinson 2016), and if a country is perceived as corrupt, research conducted there or by the country's institutions can be called into question.

Mitigation strategies

In general, academia's handling of unethical behaviour in research has been difficult, mainly because investigations are arduous; university or research institutions' administrators lack scientific expertise; and the institutions involved in any such scandal might fear the consequences to their

reputation if the details become public (Nature 2007).

Curbing corruption efforts should involve technical responses, more precise actions such as drafting guidelines or using transparent reporting systems; and mobilising the community to be less tolerant of corruption in the sector (Chapman & Lindner 2016, 262). Researchers might not always like to be told what to do, so guidelines should also maintain flexibility to accommodate how a particular research environment works (Amaral & Neves 2021). Some specific strategies are discussed below.

Academic integrity

Research integrity can be defined at two levels, individual and institutional (Ferguson et al. 2007, 191-192). "Research integrity at the individual level is defined in terms of actions and practices that characterise responsible research conduct. Research integrity at the institutional level focuses on structure, policies and procedures that promote knowledge of good practices and establishes an ethical culture in which research is carried out, specifically recognising the importance of leadership" (Ferguson et al. 2007, 191-192). This distinction is important since ethical behaviour will take place within an organisation (Ferguson et al 2007, 192) and, as discussed earlier, some of the characteristics of the environment can incentivise corruption, particularly the mix of pressure to publish and dwindling resources.

In general, the literature has focused more on student conduct and not so much on academic faculty, so it is important to take a broader understanding of academic integrity as "the values, behaviour and conduct of academics in all aspects of their practice" (Macfarlane et al. 2014, 340). It is vital to adopt a holistic approach to academic

integrity, instead of focusing only on individual responsibility (Betrag et al. 2014). The "prevention and unethical interpretation of research/publications require a comprehensive approach at different levels: individual, institutional and external controls as well as parties involved in the publication process (authors, editors, reviewers and readers)" (Regmi 2011, 78).

A key component to enhance academic integrity is helping students understand what is meant by academic honesty and increasing the students' commitment to integrity (Tatum & Schwartz 2017; Regmi 2011, 78). In general, a strategy to improve academic integrity should include education and training, fostering debate on the topic and developing policy guidelines and strong regulatory structures (Regmi 2011, 78). Universities and research institutions should implement systems of control and sanctions and have anti-corruption and academic integrity policy guidelines. Donors should focus on academic integrity and anti-corruption in the sector when working with them (Constantino 2019, 9; Kirya 2021, 19, 30).

The League of European Research Universities (LERU) recommends five key actions to increase academic research integrity in universities (LERU 2020):

1. empower sound research
2. educate researchers in research integrity
3. ensure institutional guidelines and support structures are in place
4. be transparent and accountable
5. foster a research integrity culture

Whistleblowers

Since most scientific misconduct is detected by people working in research, such as supervisors, students, peers, etc. (Shamoo & Resnik 2003 in

Gross 2016, 705), it is important to safeguard whistleblowers from retaliation and to empower students, so they play a role in social accountability (Constantino 2019, 9). Universities and research institutions should have specific whistleblowing policies (Kirya 2021, 19).

Whistleblowing mechanisms should also be sensitive to gender differences, particularly since sexual harassment and sextortion are so prevalent in the university system. Appealing to a sense of duty and especially securing anonymity can incentivise more women to report misdoings (Zuñiga 2020).

Beyond regular retaliation, whistleblowing in research environments can be complicated by the fact that, if the complaint was true, the laboratory or the research project can be closed. When the whistleblower is a graduate student or a postdoc, this can mean they will end up without financial support and/or a research project (Gross 2016, 705). Guaranteeing continued financial support or a supervisor until they receive a degree could serve as an incentive for graduate students to come forward. Postdocs and technicians could be offered funds for the rest of the funding period or until they receive other financial support. Finally, research institutions, whether universities or research centres, should ensure whistleblowers are not committing career suicide when they report misconduct (Gross 2016, 706).

Investigation of academic misconduct

In universities, investigators in cases of research misconduct are usually fellow researchers, who then are serving as judge and jury for their colleagues (Nature 2007). In this sense, it can be important to seek external auditing. As it is much more difficult to develop a sound strategy to deal with academic misconduct once the situation arises, strategies to deal with potential cases of corruption should be devised in advance. For example, in the US, the National Institutes of Health (NIH) and National Science Foundation (NSF) require that institutions applying for research funding have procedures to deal with scientific misconduct (Gross 2016, 697).

Coalitions of universities, such as the Association of African Universities and other civil society organisations can help to enhance academic integrity and ensure that universities and research institutions are complying with standards (Kirya 2021, 20). The Association of African Universities has already been addressing corruption risks and has implemented certain initiatives throughout African countries to improve higher education (Kokutse 2018). Similarly, the International Centre for Academic Integrity seeks to counter academic dishonesty in higher education and has set a set of fundamental values of academic integrity and offers different services to its member institutions. Funding bodies can also subject the research they fund to regular evaluations (Tijssen & Mbula 2017, 397).

Autonomy and internal and external regulation

Autonomy from state interference should encompass academic, financial, and organisational autonomy (Kirya 2021, 19) but cannot mean isolating academics from being accountable. Autonomy can create a corruption risk when universities are given power to exert independent control over financial matters (Constantino 2019, 5) without accountability. Independent regulatory agencies such as High Education Councils should be an important component of anti-corruption strategies (Kirya 2021, 22).

Prevention, deterrence and detection is key to countering financial fraud (Kranacher 2013, 115-116). When managing large amounts of money, a robust system of compliance and accountability is necessary to prevent embezzlement (Semrau et al. 2008, 4). In their review of a specific NGO doing a clinical trial that had been the victim of embezzlement, Semrau et al. (2008, 4) found that the NGO implemented a number of activities afterwards that helped strengthen internal control. Their new financial system had stricter internal controls on cash transactions, there was a separation of financial functions and specific steps to settle accounting records. Among other specific actions, the NGO implemented a voucher system for cash reimbursements and at least two people conducted cash counts every week to make sure that the electronic records matched the cash on hand (Semrau et al. 2008, 4).

Capacity building

One key approach to curb corruption risks is to develop tools that can facilitate good research practices (Amaral & Neves 2021) and to provide ethics training at universities with an emphasis on teaching students how to critically think about ethically sensitive situations (Kirya 2021, 25). Similarly, online courses can cover plagiarism and academic integrity (Kirya 2021, 20), and fund-granting agencies can require all people participating in the research they support to undergo training on responsible conduct of research courses (Gross 2016, 706). These courses can cover conflict of interest, ethical policies regarding live subjects, safe laboratory practices, mentor/mentee relationships and responsibilities, peer review, data collection, management and ownership of data and research tools and responsible authorship, among others (Gross 2016, 706). The recommended format for this type of course is "small-group discussion of case studies" (Gross 2016, 706).

A new and recent investment trend has highlighted the importance of strengthening African science institutions (Beaudry et al. 2018, 9). These investments, which include funding national organisations to improve states' ability to plan science, funding research chairs and centres of excellence and investing in doctoral programmes (Beaudry et al 2018, 9) could also come with an allocated budget to improve local capacity and develop monitoring offices, as well as dedicated courses for responsible conduct in research. Training can also aim to improve the quality of reporting to funding institutions or development partners as well as the capacity of the team leaders (Sida 2021a).

Addressing the 'publishing' environment

Addressing the "publish or perish" logic in an academic career could also be an important step to curb misconduct risks as several authors find this logic to incentivise unethical behaviour. De-emphasising the number of publications as a basis for promotion, appointments, tenure, etc. could be a step in the right direction, and could encourage academic research of higher quality instead of just more publications (Gross 2016, 707).

Similarly, it is time to reconsider double-blind reviews, where neither the author of the paper nor the reviewers know the others' identity, since it is no longer truly double-blind as reviewers can usually find the author through an online search, which gives them an unfair advantage (McDermott 2014). By making reviewers accountable, they are less likely to engage in unethical behaviour. This could prevent reviewers from using others'

research as their own and prevent them from giving dishonest reviews only to publish their own research on the subject first (McDermott 2014).

Additional actions should include (Tourish & Craig 2020, 184-185):

- if a paper is retracted, the journal should make the reasons clear
- if a paper by one author is retracted for fraud, then their whole work should be investigated
- there should be clear guidelines for disclosure and conflicts of interest in research and publications, and sanctions when they are not followed
- clearly label papers as "retracted" to avoid posterior citation of retracted papers

Gender sensitivity

To tackle sextortion, universities and research institutions need to develop a gender -aware approach and policies to prevent and redress sexual harassment (Kirya 2021, 18). Prevention efforts will require transversal approaches that go from policy and training to identifying how to handle cases and developing support structures (Bondestam & Lundqvist 2020, 405). Concrete examples can be taken from the UN HeForShe campaign, where universities developed programmes to address sexual and gender-based violence on campus which can have the additional positive consequence of improving gender parity at universities (Kirya 2019, 26-28).

Moreover, safe reporting mechanisms, especially to tackle challenges from power asymmetries, need to be put in place. There should also be safeguards in place for those who do report, as studies find that women reporting sexual harassment often face backlash. Medeiros (2020), notes "the failure to set up systems that protect those that report sexual harassment and challenge academia's hierarchy, enables a self-perpetuating cycle of power-abuse to flourish". To this end, a clear policy structure that is well communicated is required (Medeiros 2020).

Accountability and transparency

No anti-corruption strategy is complete without developing accountability and transparency mechanisms. In the case of academia, accountability and transparency should be present at each stage of research, beginning with transparent guidelines for the selection of PhD candidates and faculty posts, as well as for granting research grants (Sida 2021a). Admission and research grant processes could include interviews with a larger board to avoid selection based on favouritism or nepotism (Kirya 2021, 24).

In the realm of medical trials, transparency rests in five pillars:
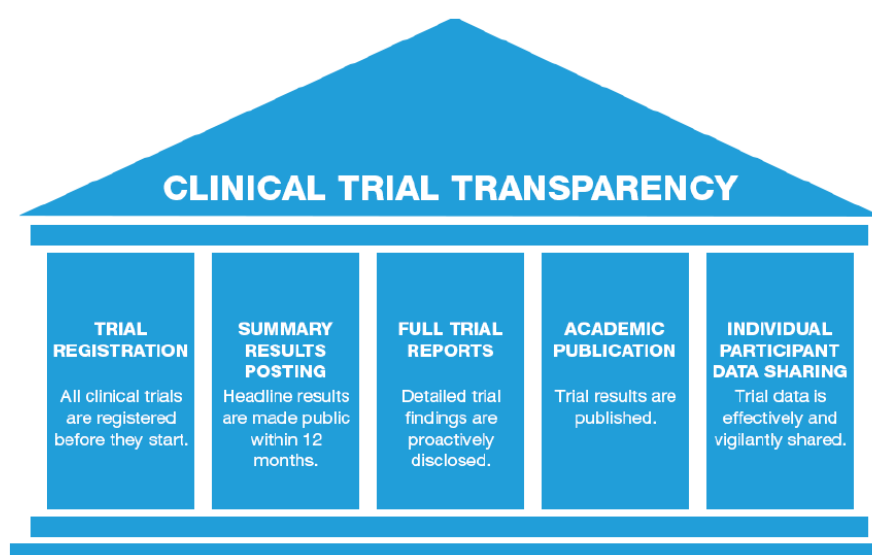
Source: Bruckner, T. 2017. Clinical Trial Transparency: A Guide for Policy Makers, 7.

Regulators can require companies to pre-register trials to prevent them from picking for publication only the ones that favour them (Bruckner 2017, 3). Registration, which is already required in some countries, ensures that no trial is hidden, countering the risks of reporting bias. Since the registration has to specify the outcome measures, it also reduces the risk of posterior evidence distortion (Bruckner 2017, 9).

Summaries of results from all clinical trials, successful or not, should be posted where the trial was originally registered within a specified timeframe after the end of the trial. This allows results to be disseminated without having to wait for academic publication, which can take longer (Bruckner 2017, 8).

Clinical study reports (CSRs) should always be made available, and not only when applying for a licence for a particular drug. These highly technical reports cover the trial in detail could allow experts to assess a trial's findings such as benefits and side effects overlooked by the original research team (Bruckner 2017, 8, 16). Trials should be published in academic journals, which are often the first source physicians turn to, or made freely available and shared among the medical community (Bruckner 2017, 8). Lastly, all trial related data on each individual participant should be shared, which can help reduce evidence distortion and fraud (Bruckner 2017, 8).

Although not every pillar can be applied 'as is' to all academic research, the transparency of the process should be maintained as far as possible. Particularly the second and third pillar, posting summary results and detailed reports, as well as the fifth pillar of sharing all relevant data, can help with reproducibility and falsifiability in other types of research. Although reproducibility might not

always be possible, it is a fundamental principle of research (Moosa 2018, 71), and both the data and the analysis and programmes behind the research should be made available (Gross 2016, 707-708). By making the whole research process more transparent, corruption risks are curtailed at every step. All academic research should have the aim of sharing data, explained how it was processed and what the findings were, even if they do not match the original expectations.

Posting data and the necessary files to accompany articles can enhance transparency, by allowing anyone to analyse it and catch fraudulent research (McDermott 2014). Authors should always keep proper data collection records, and all analysis should be properly logged. Everyone should have clarity regarding who is responsible for data collection and management (Tourish & Craig 2020, 183-184). When reproducibility is costly and difficult, research can be improved by clearly separating exploratory from confirmatory work (Amaral & Neves 2021) by encouraging and promoting different research teams to conduct different parts of a project.

Adopting reproducible research tools can have several benefits as it provides: i) the researcher with a permanent history of their own data; ii) collaborators access to common information; iii) other members of the laboratory the possibility to check what their colleagues have been doing; and iv) journals, and after publication the entire academic community, the chance to easily examine the data (Gross 2016, 708). Finally, adopting good practices for procurement, like e-procurement, which make the whole process more transparent, is also important (Sawahel 2020).

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The U4 anti-corruption helpdesk is a free research service exclusively for staff from U4 partner agencies. This service is a collaboration between U4 and Transparency International (TI) in Berlin, Germany. Researchers at TI run the helpdesk.

The U4 Anti-Corruption Resource Centre shares research and evidence to help international development actors get sustainable results. The centre is part of Chr. Michelsen Institute (CMI) in Bergen, Norway – a research institute on global development and human rights.

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