An Arab Charter of Ethics for Human – Centered Science and Technology in the Arab Region

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Ethics and Integrity in Science Codes exist since 50 years and more, but developed a lot since less than 20 years. WHY ?

Because of enormous scandals in Scientific activities with WORLDWIDE consequences ! E.g. the Wakefield's scandal:

- **In 1998, the UK medical Journal "the Lancet" published an article signed by A. WAKEFIELD and 12 other professors and physicians[1]. The article developed 12 cases of autist children, and linked their autism with the M.M.R. (Measles, mumps, and rubella) vaccine !**

- **Immediately the "information" was repeated in numerous journals, everywhere ; even if quickly scientists published papers saying their studies showed no evidence of such a link, the public believed this article and damage for public health was enormous and longlasting !**

- **This article was a fraud. The data were falsified by Dr. WAKEFIELD ; he was the only real author, the 12 other authors retracted and admitted they didn't verify the text !**
- **Everywhere parents decided to refuse this very important vaccine ; and measles, an illness which had disappeared, came back with force in Europe, USA, and particularly in UK, where it became endemic.**

- **The distrust of public towards vaccines is now a real general problem, causing a public health general problem: if the level of vaccine is not 80 % up to 95 % (depending of the kind of illness) the vaccines are not able to protect those who are not vaccined…**

The results of this scientific fraud lasted for nearly 20 years and it is not finished: it affected public health everywhere!

Usefulness of an Ethics Charter at the level of the Arab Region

What has been done in USA and Europe?

I. The development of the Codes of Ethics

Codes of Ethics are not a novelty. Some were written more than 60 years ago. But there is an important development of these since 10 years, and many Codes were recently rewritten in order to reflect 21st century standards and technology (and because of increase of research misconduct, some say).

A. The Codification at international level

1. The global approach

The OECD Global Science Forum organized in February 2007, in Japan, a workshop on *Best Practices for Ensuring Scientific Integrity and Preventing Misconduct.* The report describes the categories of misconducts by scientist and the options for dealing with misconduct allegations[2].

Then, a first *World Conference on Research Integrity (WCRI)* was organized in Lisbon, in September 2007, by the European Science Foundation (ESF) and the US Office of Research Integrity (ORI), together with the European Commission, Nato, etc. 47 countries were represented. It was underlined that, if Codes have to be organized at national level and in each discipline, **an international cooperation for developing coherent rules and procedures is essential[3].**

The 2nd *World Conference (WCRI)* took place in Singapore, in 2010. The Conference published the *Singapore Statement on Research Integrity*, which contains **14 responsibilities principles for researchers and research institutions, applying general principles (honesty, accountability, professional courtesy and fairness, good stewardship**). The Singapore statement is often referred to and given as model in the Codes of Conduct or Ethics[4].

In 2013, the 3rd *World Conference (WCRI)* in Montreal, developed the *Montreal Statement on Research Integrity in Cross-Boundary Research Collaboration*, frequently referred to also[5].

In Europe, the ALLEA (which is the organization assembling all European Academies) issued this year the new version of its *European Code of Conducts for Research Integrity* (the first

version was made in 2011). It was made after a large consultation among public and private major stakeholders in European Research. It is really an European codification[6].

The Code defines first the fundamental principles (Reliability, Honesty, Respect and Accountability). Then it describes the "Good Research Practices", in 40 clear rules. In the 3rd part, the Code defines **the research misconduct with the 3 categories: Fabrication, Falsification, Plagiarism** (which were described by the OECD Global Science Forum). It describes also the principles of **Integrity and Fairness which have to be respected during the handling of misconduct.**

This Code is a reference for the European Commission. Art. 34 of the 'Model Grant Agreement of Horison 2020' stipulates: 'Beneficiaries must respect the highest standadrds of research integrity – as set out for instance in the European Code of Conduct for research integrity'.

The Committee on Publication Ethics (COPE) gathers international editors and publishers. Also many international scientific journals are members of COPE. COPE has published a code of conduct and best practice Guidelines for journals editors, which is the reference for international editors.

For instance SPRINGER published a Guide for Editors-in-Chief, Associate Editors, and Managing Editors, informing them about their guidelines they have to follow about[7]:

-the acceptance of a work for publication;
-the peer review process (with an Ethical code for peer reviewers);
-the compliance by authors with ethical requirements.

The Guide describes the steps to follow: in case of possible misconduct, about six fundamental ethical issues (data fabrication or falsification; duplicate submission or publication; plagiarism; authorship issues; undeclared conflict of interest). For each issue there are detailed COPE guidelines.

The detection of plagiarism is facilitated by screening softwares, which are often proposed by international editors to their journal editors[8].

2. The approach by discipline

Let's examine some examples. The World Health Organization (WHO) edited in 1995 the Guidelines for Good Chemical Practice (GCP) for trials or pharmaceuticals products. It edited also in 2004 a Practical Guide for Health Researchers (authors: M. Fathalla and M. Fathalla, professors at Assiut University, Egypt: it is a very complete and precise guide, with more than 200 pages[9]). It describes the ethical responsibilities at each step of the research, and publication of the results[10].

The European Mathematical Society published (in 2010, then a new version in 2012)[11] a code of practice describing the ethical behavior in the publication, dissemination and assessment of Mathematical Research. It specifies what should be considered as misconduct or an ethical behavior of authors, editors and publishers, referees, and users of bibliometric data. The procedure followed by the Ethics Committee is also explained. The Code is published on the EMS website.

-> this "Code of Practice" has been approved by many national societies and published on their websites = importance of the **international codification** !

-> the Ethics Committee publishes on the website its "Comments by the Committee on the Code of Practice" = easy way to update the Code of Practice and publish the updating !

B. The codification at national level

In Germany, the German Science Foundation (DFG), in UK the Research Council of the United Kingdom (RCUK), in Belgium the four Royal Academies[12], have published Codes of Ethics. There are such codes in all countries. In France, a global Charter has been prepared and signed in 2015 by a group of large national bodies (the C.N.R.S, INSERM, INRIA, CIRAD, IRD, CPU)[13].

C. The codification at level of institutions

Of course Universities and Research Institutes edit their own codes (e.g.: Code of Ethics about research in Psychology, Laboratory URECA of University Charles de Gaulle, Lille; Code of Ethics of the University of Geneve; The University of Liege (Belgium) has organized a procedure about misconducts against scientific integrity; these last guidelines describe the acts which are misconducted, in collecting scientific data, in collaboration with other researchers, and publication, in actions for obtaining research funds, in scientific reviews for others. The guidelines organize the procedure, including a permanent organ (the Council for Ethics and scientific integrity) and an "ad hoc" organ (a commission in charge of investigate the facts).

The development of Ethics Codification is not limited to the scientific world; we see also large companies developing their Codes of Ethics and organs for control and compliance – for preserving their trust worthiness, and eliminate corruption (for instance, in Belgium, ENGIE[14]).

How can ethical standards of science and technology help address the key challenges facing science and technology in the Arab Region ?

A good example: the "MONSANTO papers"

In 2015, the C.I.R.C. (agency of the W.H.O.) published its results about the glyphosate (used in Roundup, a weed killer produced by MONSANTO): it is a probable carcinogenic agent.

Up to then, various international and independent agencies (in USA, E.P.A. ; in Europe, E.C.H.A., and E.F.S.A.) had published studies with the conclusion that glyphosate was not dangerous for health.

In USA, more than 3000 persons suited MONSANTO and accused the firm of having caused deadly cancers, with this product. MONSANTO was convicted to communicate internal and confidential documents. The French Journal LE MONDE has made a study of thousand pages published by MONSANTO (after this conviction) and established that these studies were 'ghostwriting' : MONSANTO employees wrote these studies and obtained the signature of famous scientists, by paying them (largely).

This scandal shows how important these Ethics and intergrity in reserarch Codes are : they protect our societies against most serious dangers.

It shows also it is difficult to detect the misconducts. For instance, the American journal FORBES asks his author to sign an Ethics contract. The famous American scientist Henry Miller had signed it. But it has been proven that MONSANTO had paid him and written an article about the glyphosate which H. Miller had accepted to sign and publish on FORBES website… FORBES has deleted all articles signed by H. Miller…

What mechanisms need to be put in place to promote the implementation of the Charter?

Preliminary comments: differences linked to the disciplines

It is interesting to observe that the experiences are not the same in all disciplines. Here are the comments of Prof. Paul R. Lecoq, who works at the C.E.R.N. (Geneva):

« In our case the control is relatively easy, as our work is mainly collective. We are working within large international collaborations and the group is self-regulating. We cannot afford having a black sheep in the group! His or her misbehaviour will be immediately detected and condemned, as the fault of one collaborator will impact the whole group.
This is obviously not necessarily true for all disciplines. Biology and medicine for instance are much more fragmented sciences, led in the majority of the cases by individuals. The pressure from the community is therefore more difficult to operate. And this is not a surprise if the

majority of problems (plagiarism, frauds, conflicts of interest, etc...) are detected in these disciplines.
In conclusion, I would say that if it is important to have a number of rules in a code of ethics it is even more important to define who will be the policeman and the judge! This si not an easy question to answer.
This is of course my own, biased view, based on my specific experience in a large international organisation ».

Paul R. Lecoq, Head of EurASc Physics Division

II. The development of the procedures and ways to promote implementation of the Codes of Ethics

A. At international level: the experience of the EMS Ethics Committee

- **Cases of misconducts**

Most of the accusations received by this Ethics Committee are about plagiarism. Some of them are blatant, and the Committee is worried about the 'predatory journals', accepting to publish 'verbatim copies of other works', for the publication fee.

The cases of self-plagiarism increase, and the Committee observes that the number of simultaneous submissions of some research has increased.

- **Procedure**

The Committee members verify first if a 'prima facie' case exists. If yes, they contact the accused person or bodies and ask them their view of the case: these can make amends.

If not, the Committee will ask advice from independent external experts, and communicate its findings to the parties.

If the accused person or body doesn't make amends, the official report will be sent to the President of EMS.

- **Progresses obtained**

The 'Code of Practice' prepared by the Ethics Committee is approved and published by many national societies (on their websites). Several journals also adopted it. The Committee works mostly by emails, but has yearly physical meetings, which is important for discussing the most delicate issues.

The Committee considers its work is efficient, the publication of the 'Code of Practice' helps mathematicians to understand the ethics issues, and it is also helped by the publication by the Ethics Committee of its 'Comments by the Committee on the Code of Practice'.

B. At national level: the recent developments in France

In France the government asked Prof. Pierre Corvol (Collège de France) to prepare a report about the existing Codes and procedures and to make proposals to improve the situation. This report was finished in June 2016[15].

Here are the main conclusions of his report.

- **Reasons of misconducts**

Mostly, money: the misconducts are made to obtain a job, or funds for a research… also for the glory!

- **Problems of proofs**

Proofs are easier for plagiarism because of softwares of detection (some are free of charge).The FF are detected by co-authors, collaborators, other researchers unable to reproduce the results. A useful institution is the 'Pubpeer', where you can discuss anonymously with authors.

Important conclusion: it must be possible to denounce some misconduct to the 'Scientific Integrity Referee: so his/her address, phone number, has to be visible on the Institution website.

- **Responsibilities**

The first responsibility is the one of the researcher, of course. There is a responsibility of the institution, which must make all arrangements to prevent and sanction the misconduct. There is also a responsibility of the chairman of the institution; it is important to mandate a 'Scientific Integrity Referee', to facilitate the denunciations.

- **Organization of the control**

The contracts with the PhD students have to impose courses about scientific integrity. One file about the ethics and integrity in scientific research issues has to be give to the PhD students, and a copy in his/her file.

The tender documents (for European or French projects) have to require a course on scientific integrity. Agencies funding research institutions and universities have to verify the attendance to such trainings.

There should be a national organ, in charge of controlling the trainings in the institutions, and of detecting plagiarism in publications, doctoral thesis…

- **Trainings**

A general training should be organized at national level. This training should be followed, not only by the PhD students, but also by the students before writing their master thesis, and the professors.

- **Sanctions**

There are sanctions organized by the penal laws; by the laws about civil servants; and by the disciplinary rules.

There should be a national 'Vademecum', with typology of misconducts, cases examples, and typology of sanctions.

It is important to organize an appeal for serious cases, with an external committee including not to be contested personalities.

There should also be specific trainings. Cases could be discussed in little groups. Another possibility is to propose video trainings, on the institution website. This could be organized at national level.

A 'quiz' could be the way to validate the training.

- **Procedures and organs**

There has to be a 'Scientific Integrity Referee', and his/her address and phone number must be on the institution website. The anonymous denunciation should be refused, but the denunciator's name would not be repeated and remain confidential. A good solution is to organize an 'ad hoc' committee, with professors of the institution and external professors, to examine the documents and interview the plaintiff, the accused persons, etc. The report should be submitted to the Chairman of the institution, possibly after consulting an Ethics Committee for advice. The Chairman decides the sanction.

C. At institutional level: the example of University of Liege

The University of Liege (Belgium) has approved a new Regulation in 2015; it defines clearly the significance of research integrity and the various cases of misconducts[16] [17].

The procedure is explained. A special Committee has been established, the Ethic and Scientific Integrity Council (C.E.I.S.).

The complaint must be sent to the C.E.I.S. or one of its members; the plaintiff can make a complaint because of his/her personal interests, or not. The C.E.I.S. mandates one of its members to examine the case and question the parties.

When there is no public interest at stake, the C.E.I.S. investigator seeks for a solution between parties (mediation). In serious cases he/she sends the report to the C.E.I.S.

The C.E.I.S. verifies the report (examines again the documents, organizes new hearings of the parties). If it decides the complaint is not justified, it announces its decision to parties. Otherwise, it forwards the case to the University President, who will constitute an 'ad hoc' Commission.

This Commission shall have at least 3 members specialized in the concerned matter; and no member of C.E.I.S. can be member of this Commission. This Commission shall investigate the case in maximum 90 days; il shall inform both parties about its investigation. The Commission sends its report with a proposal of solution (or sanction) to the President and the C.E.I.S., and parties. The report explains the possible deontological faults (and in such cases the report is also sent to the Deontological Authority) and in case of misconduct linked to a publication, explains if the case justifies a request of retractation to the scientific journal.

The President takes the decision (about the sanction) within 30 days (all steps of the procedure have response times).

CONCLUSION

As Prof. P. Lecoq underlined, "*it is important to have a number of rules in a Code of ethics, it is even more important to define who will be the policeman and the judge ».*

And this was well shown in the terrible 'MACCHIARINI SCANDAL' [18]!

It occured in the most respected Karolinska Institute, Stokholm (where the Nobel Prize in Medicine is attributed, each year).

The K.I. hired a star surgeon , Paolo Macchiarini, without verifying his CV, and against the negative advice received by the experts. When Prof. Macchiarini decide to perform a new treatment, building artificial trachea seeded with the stem cells of his patients, nobody verified his reports (about the preclinical research, preliminary experiment, with animals) : they were false , he used his patients as 'guinea pigs' ; and they died (7 patients died, one survived after a new trachea transplantation, from a donor).

The Vice-Chancellor of K.I. and its Dean of Research were asked to resign from the Nobel Assembly. There was not a problem of rules, but of respect of regulations, and control…

Another important conclusion is that international collaboration is a necessity in this matter: all comments underline this. So I recommend to the future Committee in charge of updating of the Charter to attend the next World Conference on Research Integrity.

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REFERENCES

1 F. GODLEE et al., « Wakefield's article linking MMR vaccine and autism was fraudulent », www.ncbi.nlm.nih.gov/pubmed/21209060; T.S. SATTHYANARAYANA and Chittaranjan ANDRADE, « The MMR vaccine and autism: Sensation, refutation, retraction, and fraud », www.ncbi.nlm.nih.gov/pmc/articles/PMC3136032/

[2] www.oecd.org/sti/sci-tech

[3] www.archives.esf.org/researchintegrity

[4] www.singaporestatement.org

[5] www.researchintegrity.org/statements

[6] www.allea.org/uploads/2017/03

[7] www.springer.com/gp/authors-editors/journal-author

[8] For Elsevier Publishing Ethics Resource Kit, www.elsevier.com/editors/perk

[9] www.who.int/emro_ethics_dsa237

[10] About procedure : www.who.int/ethics/review-committee/en

[11] www.euro-math-soc.eu/COP-approved

[12] www.belspo.be/Eth_code

[13]unice.fr/recherche/.../charte-nationale-de-deontologie-des-metiers-de-la-recherche

[14] www.engie.com/groupe/charte

[15] www.enseignementsup-recherche.gouv.fr/

[16]www.recherche.uliege.be/upload/docs/application/pdf/2017-10/reglement_ethique_et_integrite_scientifique-_ca_13_05_2015_.pdf

[17] Other example : governance and integrity, research ethics, in Oxford : www.researchsupport.admin.ox.ac.uk/governance/ethics

[18] www.nature.com/news/macchiarini; www.bbc.co.uk/news/magazine-37311038 (Paolo Macchiarini: a surgeon's downfall)