



HAL
open science

Human-Centred Research & Design for Inclusive Mobility. Section D–Ethical Considerations

Bako Rajaonah

► **To cite this version:**

Bako Rajaonah. Human-Centred Research & Design for Inclusive Mobility. Section D–Ethical Considerations. 2024. hal-04427807v1

HAL Id: hal-04427807

<https://uphf.hal.science/hal-04427807v1>

Preprint submitted on 31 Jan 2024 (v1), last revised 5 Sep 2024 (v3)

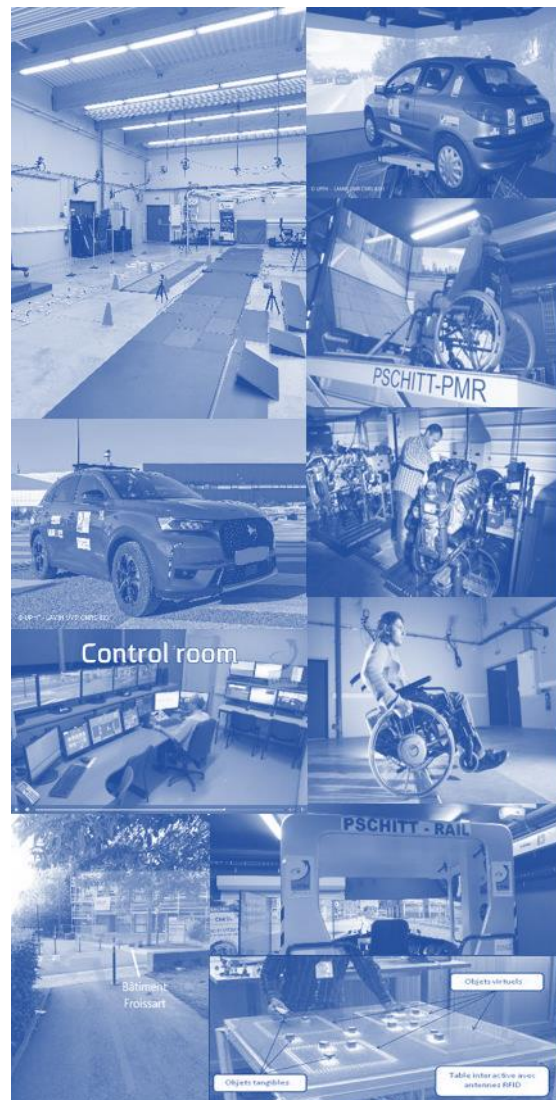
HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License

Human-Centred Research & Design for Inclusive Mobility Section D—Ethical Considerations



Dr. Bako Rajaonah
UPHF, CNRS, UMR 8201-LAMIH
SHV Department

General contents

Introduction

Contents of Sections A and B (2022)

Human-Centred Research & Design for Inclusive Mobility. Section A—Platforms, Technologies and Projects

- A.1 Platforms and simulators
 - A.1.1 Definitions
 - A.1.2 Some simulators at LAMIH
- A.2 Technologies dedicated to mobility
 - A.2.1 Definitions
 - A.2.2 Some technologies at LAMIH
- A.3 Virtual reality, mixed reality, and augmented reality
 - A.3.1 Definitions
 - A.3.2 Behavioural interfaces
 - A.3.3 Some applications at LAMIH
- A.4 Interactive tabletops

Human-Centred Research & Design for Inclusive Mobility. Section B—Human-centred approaches

- B.1 General remarks
 - B.1.1 Concepts
 - B.1.2 Principles
- B.2 Research & design centred on human factors
 - B.2.1 Definitions
 - B.2.2 A brief panorama of human factors for the studies of human-machine systems
- B.3 Research & design centred on users
 - B.3.1 Definitions
 - B.3.2 Measurements in the users-centred design approach

Contents of Section C (2023)

Human-Centred Research & Design for Inclusive Mobility. Section C—Doing Science (2023)

- C.1 The scientific démarche
 - C.1.1 General definitions
 - C.1.2 Scientific démarche
- C.2 Doing science
 - C.2.1 Qualitative research
 - C.2.2 Quantitative research
 - C.2.3 Mixed methods research
- C.3 Conclusion
- C.4 Acknowledgments
- C.5 References and bibliography

Contents of Section D and E (2024)

Human-Centred Research & Design for Inclusive Mobility. Section D—Ethical Considerations

- D.1 Integrity of the Researcher
 - D.1.1 Good practices
 - D.1.2 Misconduct
- D.2 Integrity of Research: Concrete illustrations
 - D.2.1 Research design & execution
 - D.2.2 Management of data & publications
 - D.2.3 Research involving human participants
 - D.2.4 Intellectual property

Human-Centred Research & Design for Inclusive Mobility. Section E—Writing

Introduction

This document is the fourth part of a five-piece work on human-centred research and design for inclusive mobility intended for future research candidates at [Université Polytechnique Hauts-de-France \(UPHF\)](https://www.uphf.fr/en)¹ and [INSA Hauts-de-France](https://www.uphf.fr/insa-hdf/en/presentation/insa-hauts-france)², as well as the PhD Students of the [Laboratory of Industrial and Human Automation control Mechanical Engineering and Computer Science \(UPHF, CNRS, UMR 8201-LAMIH\)](https://www.uphf.fr/lamih/en)³. The goal of the whole work is to help students understand the principles of human-centred design of technologies and services.

Indeed, according to the European Union (EU), the European industry will serve society better by complementing the techno-economic vision of Industry 4.0 (digitalization, AI technologies, efficiency and flexibility of production) with the Industry 5.0 perspective which focuses on human centricity, sustainability and resilience (Renda et al., 2022).



Source : Breque et al., 2021, p. 13

The two first parts present UPHF and LAMIH – particularly regarding the research strategies and the platforms and projects around mobility and the maintaining of mobility – as well as two human-centred theoretical approaches to technology design⁴. The third part presents the qualitative and quantitative approaches in research⁵. The next part (the present document) broaches the topic of ethical research. The fifth and last part will conclude the whole work with the writing of scientific papers.

¹ <https://www.uphf.fr/en>

² <https://www.uphf.fr/insa-hdf/en/presentation/insa-hauts-france>

³ <https://www.uphf.fr/lamih/en>

⁴ <https://hal.science/hal-03726812>

⁵ <https://uphf.hal.science/hal-04093130>

Contents of Section D—Ethical Considerations

1	Integrity of the Researcher	8
1.1	Good practices	9
1.2	Research Misconduct	10
2	Integrity of Research: Concrete Illustrations	16
2.1	Research Design & Execution	16
2.1.1	Research Question	16
2.1.2	Research Protocols	17
2.1.3	Data Collection	18
2.1.4	Data Analysis & Interpretation	19
2.1.5	Publication	20
2.1.5.1	Publishing	20
2.1.5.2	Reviewing	22
2.2	Management of Research Data & Publications	23
2.2.1	Management of Research Data for Open Science	26
2.2.1.1	FAIR Data Principles	26
2.2.1.1.1	Findable	27
2.2.1.1.1	Accessible	27
2.2.1.1.2	Interoperable	27
2.2.1.1.3	Reusable	27
2.2.1.2	Data Management Plans	28
2.2.1.3	Research Data Repositories	30
2.2.2	Management of Publications for Open Science	34
2.2.2.1	Open Archive	35
2.2.2.2	Green, Gold, and Diamond Open Access Publication	37
2.3	Research Involving Human Participants	39
2.3.1	Management of Personal Data: The GDPR	40
2.3.2	Informed Consent	43
2.3.3	Ethical Assessment of Research Project Involving Human Participants	44
2.4	Intellectual Property	47
3	Acknowledgments	53
4	References and Bibliography	53

Human-Centred Research & Design for Inclusive Mobility. Section D—Ethical Considerations

The purpose of this document is to introduce the student to main ethics issues in research.

Research aims at producing knowledge that can be useful to society (e.g., Grønhaug & Olson, 1999) and the environment (e.g., Yañez-Figueroa et al., 2021). This viewpoint involves that some moral values underpin research, even if only the respect for the other in all its forms (ALLEA, 2017, 2023) and responsibility for nature (e.g., Jonas, 1973).

Morality refers to a set of standards and values which stands between (i) ethics⁶ that reflects a questioning about rules, obligations, interdictions and priorities and (ii) ethics⁷ that are applied (e.g., Ricoeur, 1989, 2000).

However, in science and research, both morality and ethics can be related to integrity (Stoeklé, Ivasilevitch, & Hervé, 2023) and the present document broaches the topics of ethics and morality through the single concept of [integrity in science and research](#) (ALLEA, 2023; ANR, 2019; CNRS Ethics Committee, 2020); it covers the existing rules and procedures for ethical conduct in science and research.

[Integrity in science and research contributes to enhance citizens’ trust in science, researchers, and in a general way, in the research system and research results](#) (Albert & Shines, 1994; ALLEA, 2023; Bouter, 2023; COMETS, 2020; Haven et al., 2022; Ofis⁸). As it is illustrated by Figure 1, integrity applies to many aspects of science and research; the figure also shows that integrity is two-level because those aspects concerns either researchers or research.

Notice that scientific integrity in France is established in the French Research Code⁹ through *l’Ethique de la recherche* (Articles L211-1 to L211-2).

⁶ Functioning as singular: “the philosophical study of the moral value of human conduct and of the rules and principles that ought to govern it” (<https://www.collinsdictionary.com/dictionary/english/ethics>)

⁷ Functioning as plural: “a social, religious, or civil code of behaviour considered correct, especially that of a particular group, profession, or individual” (ibid.)

⁸ The French Office for Research Integrity: <https://www.ofis-france.fr/en/> (accessed on 21 August 2023)

⁹ https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006071190/ (accessed on 13 Dec. 2023)

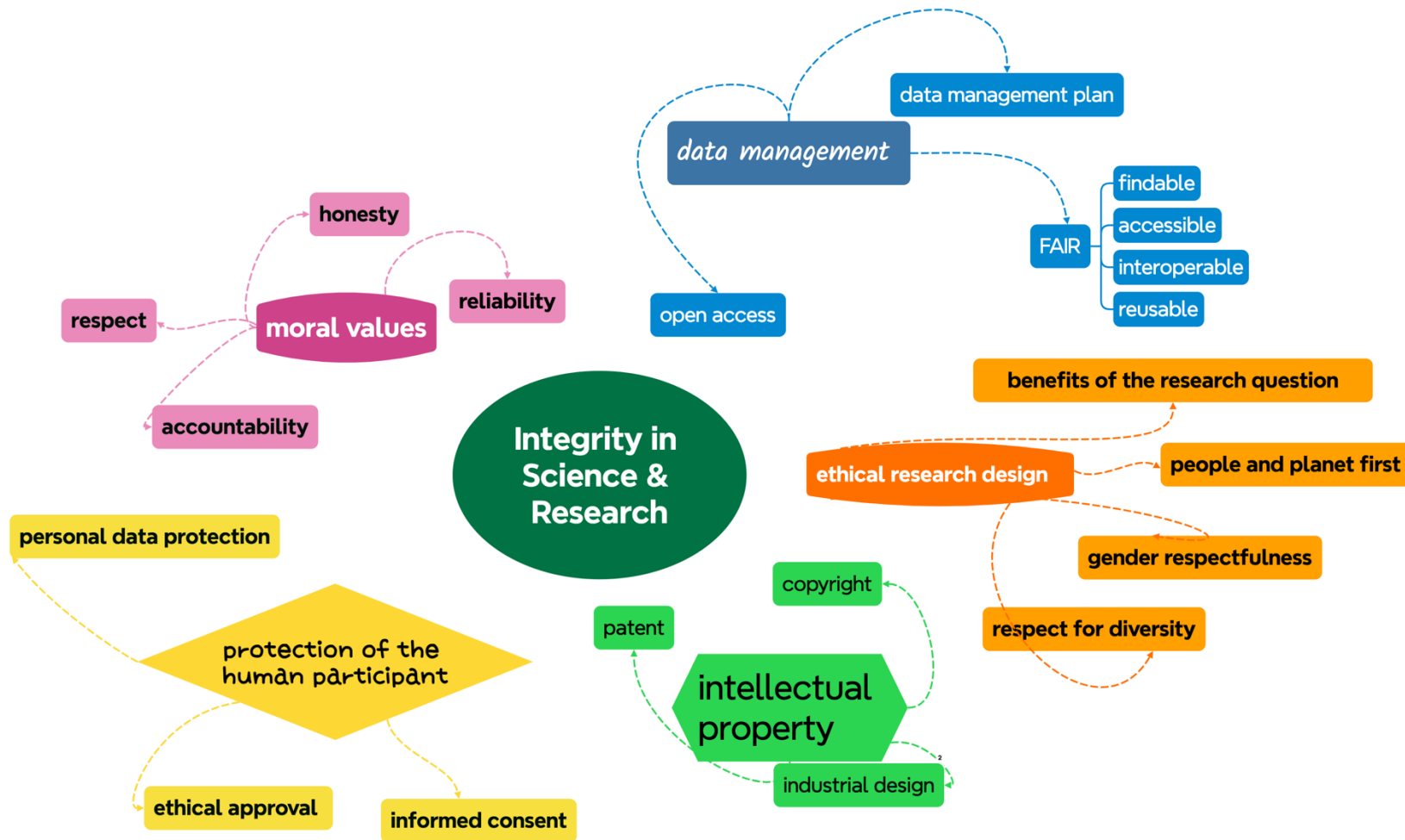


Figure 1 The many facets of integrity in science and research (Xmind)

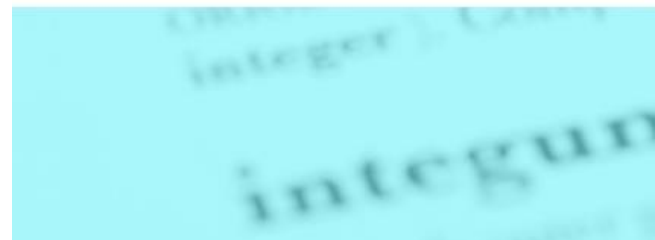
- Researchers are defined as “professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, as well as in the management of the projects concerned¹⁰.” Research institutions are at this level. Among the roles of institutions: ensuring a culture of research integrity, promoting values such as inclusion and equity, supporting infrastructure for the generation, management and protection of data, especially regarding their reproducibility, traceability and accountability (ALLEA, 2023).
- Basic research is “experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view,” while applied research is “directed primarily towards a specific, practical aim or objective” (OECD, 2015). As COMETS (2020) remind us, the value and benefits of research vitally depend on the integrity of research.

Our work mainly applies to human-centred technologies and services for inclusive mobility, but its ethical considerations concern all fields of

research. Chapter 1 explains integrity through the researcher, good practices and misconduct included. Chapter 2 deals with the integrity of research per se, through ethical research design and execution (§ 2.1), the management of research data and publications (§ 2.2), the management of research involving human participants (§ 2.3), and the management of intellectual property (§ 0) (Figure 2)



**The European
Code of Conduct for
Research Integrity**
REVISED EDITION 2023



Source : <https://allea.org/>

¹⁰ OECD (2023), Researchers (indicator). doi: 10.1787/20ddfb0f-en (accessed on 22 August 2023)

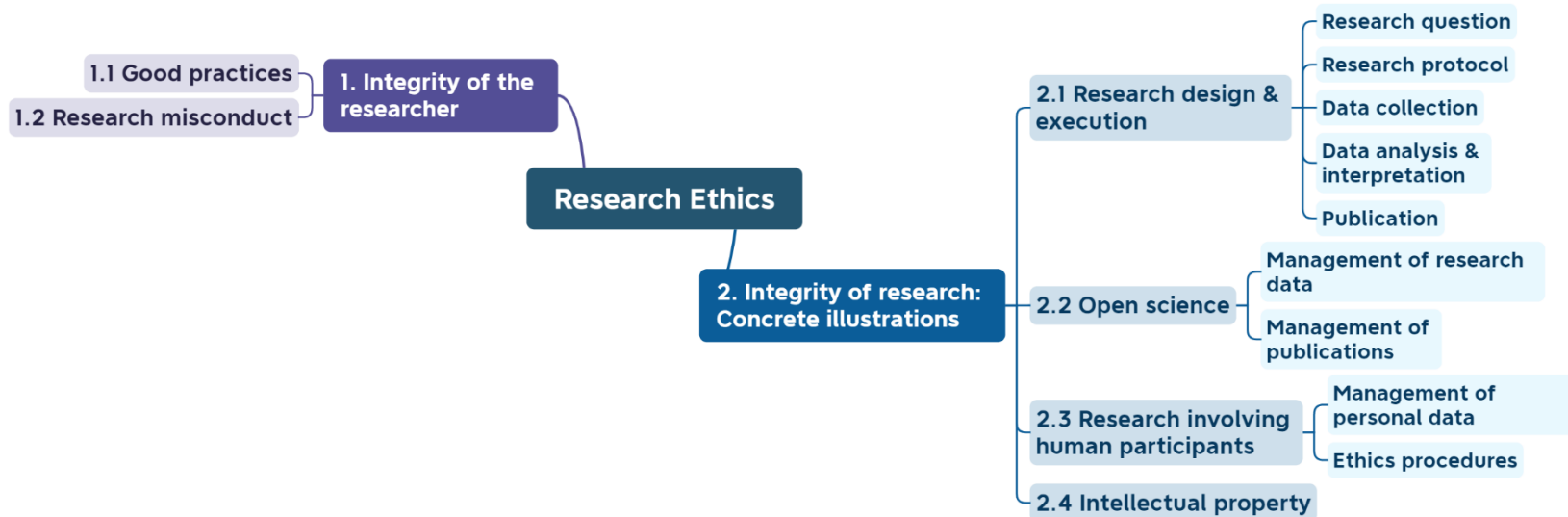


Figure 2 Main contents of Section D (Xmind)

1 Integrity of the Researcher

The dictionary's definition of integrity is "adherence to moral principles" (Collins, 2018). Research integrity is defined in the French Research Code (article L. 211-2) as "the set of rules and values that must govern research activities in order to guarantee their honest and rigorous nature" (Ofis⁸). Scientific integrity is also "the refusal to allow scientific values to be corrupted by financial, social or political pressure" (COMETS, 2020, p. 4). Such definitions focus on the researcher, as it is noticed in Helgesson and Bülow (2023). For example, the Code of Conduct for Research Integrity published by the European Federation of Academies of Sciences and Humanities stipulates that good research practices rely upon the following principles: **reliability**, **honesty**, **respect**, and **accountability** (ALLEA, 2017, 2023), which are human qualities. According to Broad and Wade (1987), the researcher's personal ethics is not so far off as the moral rules that govern societies. Such moral qualities are required along the researcher's activities.

According to ALLEA (2023):

- Accountability is to be responsible for the research from idea to publication, and also for its wider societal impacts;
- Honesty is to be honest "in developing, undertaking, reviewing, reporting and communicating research in a transparent, fair, full and unbiased way";
- Reliability is about ensuring the quality of research at the levels of design, methodology, analysis, and use of resources;
- Respect is to be respectful towards "colleagues, research participants, society, ecosystems, cultural heritage and the environment."

The principles of the 2018 Netherlands Code of Conduct for Research Integrity¹¹ include the two following 'virtues' among others (p. 13).

- Scrupulousness, that is, "using methods that are scientific or scholarly and exercising the best possible care in designing, undertaking, reporting and disseminating research";

¹¹ <https://doi.org/10.17026/dans-2cj-nvwu/https://www.nwo.nl/en/netherlands-code-conduct-research-integrity> (accessed on 7 Sept. 2023)

- Independence, that is, not allowing the choice of method, the assessment of data, the weight attributed to alternative statements or the assessment of others' research or research proposals to be guided by non-scientific or non-scholarly considerations [...]”.

Let us now examine the two facets of the integrity of the researcher, namely, good practices and misconduct.

1.1 Good practices

First of all, ALLEA specifies that researchers—whoever they are, from junior to the most senior level – should benefit from training in ethics and research integrity.

We strongly recommend the students to read the twenty-page European Code of Conduct for Research Integrity (ALLEA, 2023). It contains guiding principles for researchers and research institutions; some of them are presented as follows.

- Complying with codes, guidelines and regulations;
- Using research funds properly and conscientiously;
- Acknowledging potential harms and risks relating to their research and its applications and mitigating possible negative impacts of their research;
- Designing, carrying out, analysing and documenting research in a transparent way;
- Designing research protocols that are respectful of differences (i.e., culture, religion, worldview, ethnicity, social class, etc.);
- Handling research participants and related data with respect and care;
- Informing them about how their data will be used, reused, accessed, stored and deleted in compliance with the European General Data Protection Regulation;
- Reporting “results and methods, including the use of external services or AI and automated tools, in a way that is compatible with the accepted norms of the discipline and facilitates verification or replication, where applicable” (p. 7);
- Ensuring the FAIR principles (Findable, Accessible, Interoperable, Reusable) for data management (§ 2.2.1.1);

- Agreeing on the sequence of authorship, acknowledging that authorship is based on: a significant contribution to the considered study (research design, data collection and analysis, interpretation), the drafting and/or reviewing of the manuscript; the approval of the final version; agreeing to be responsible for the content of the publication unless specified otherwise in the publication;
- Being accurate and honest in their communication to colleagues, policy makers and society at large.

The Cape Town Statement on Fostering Research Integrity through Fairness and Equity provides 20 recommendations¹² (Horn et al., 2023), among which the following:

- Researchers should recognize the value of collaborating with colleagues from different disciplinary, geographical, cultural, and ethnic backgrounds and strive to achieve this diversity, especially when doing research in contexts and environments that are different from their own.

The implementation of those good practices is concretely illustrated in Chapter 2 with § 2.1 relating to the integrity of research design, § 2.2 to data management, § 2.3 to research involving human participants, and § 2.4 to intellectual property.

Integrity of the researchers can also be examined through their misbehaviours; the consequences of some of them may distort knowledge (e.g., Finelli, 2009) and can be very costly to society (Faucheux et al., 2019).

More precisely, the rest of the chapter is devoted to misconduct in research, which is a worldwide well-documented topic (e.g., Al-Adawi et al., 2016; Alfaro-Toloza et al., 2013; Bak, 2018; Dubois et al., 2013; El Bairi et al., 2022; Khezzr & Mohan, 2022; Hosseinpur et al., 2023; Hugues & McCabe, 2006; Okonta & Rossouw, 2014; Olesen et al., 2018; Patnaik, 2016; Singh & Remenyi, 2016; Tanimoto et al., 2013; Tavaré, 2011; Vasconcelos et al., 2023).

1.2 Research Misconduct

Notice first that research misconduct is not limited to plagiarism nor the fabrication of data and results and the falsification of them, but, as it is emphasized by the CNRS Ethics Committee

¹² Word Conferences on Research Integrity: <https://www.wcrif.org/guidance/cape-town-statement> (accessed on 4 September 2023)

(COMETS, 2020), fabrication, falsification and plagiarism (FFP) are internationally considered as scientific frauds.

- “**Plagiarism** is the misappropriation of somebody else’s idea or content (text, images, tables, graphics, etc.) in part or as a whole without the permission of the author or without correctly referencing the source” (COMETS, 2020, p. 24). The Finnish guideline on research integrity specifies this definition: “plagiarism can be direct, modified or paraphrased” (Keiski et al., 2023, p. 17). The US Office of Research Integrity does not consider self-plagiarism as research misconduct¹³; however, ALLEA (2023) specifies that using parts of one’s earlier publications requires to acknowledge or cite the original work. This issue of plagiarism will be addressed in Section E relating to writing.
- Accessed on Elsevier’s website at the Author services’ page¹⁴: **Fabrication** is “about making up research results and data, and reporting them as true. This can happen when a researcher, for example, states that a particular lab process was done when, in fact, it wasn’t. Or that the research didn’t take place at all, in the case of a study results from previous research copied and published as original research.”
- And: “**Falsification** essentially involves manipulating or changing data, research materials, processes, equipment and, of course, results. This can include altering data or results in a way where the research is not accurate. For example, a researcher might be looking for a particular outcome, and the actual research did not support their theory. They might manipulate the data or analysis to match the research to the desired results”¹⁴.

According to the OECD Global Science Forum, misinterpreting data to obtain desired results, doctoring images in publication, producing false data or results under pressure from a sponsor are parts of FFP (OECD, 2007, p. 3).

The Finnish research system distinguishes research misconduct (i.e., FFP) and disregard for good research practises (Keiski et al., 2023), whereas Martinson et al. (2005) noticed that some questionable practices were not considered as FFP and yet could be sanctionable, see the top ten practices from these authors in Table 1.

¹³ The US Office of Research Integrity: <https://ori.hhs.gov/about-ori> (accessed on 28 August 2023)

¹⁴ <https://scientific-publishing.webshop.elsevier.com/manuscript-review/research-fraud-falsification-and-fabrication-research-data/> (accessed on 25 August 2023)

FFP and misconduct in general have serious consequences for researchers, research participants, institutions, fields of research and society (Science Europe, 2015). These consequences can be expressed in terms of costs such as in the work of Faucheux et al. (2019) in the Horizon 2020 Project “Define the global and financial impact of research misconduct” (DEFORM)¹⁵ or in the 2012 iThenticate Report¹⁶ that cites individual costs (e.g., loss of jobs, revoked PhD, revoked awards), brand costs (e.g. damage reputation), capital costs (legal costs, lawsuits, investigation costs, etc.), and human costs (think of the medical damage that can be caused by incorrect information in the medical literature, see Steen, 2011). Notice that an unintentional violation of research does not “absolves researchers of ethical responsibility” (Kromrey, 1993).



Source: © J. GERNIER for CNRS News (<https://lejournal.cnrs.fr/articles/sept-cas-celebres-de-scientifiques-accuses-de-fraude>, accessed on 28 August 2023)

Table 1 provides instances of violation of research integrity, taken verbatim from the following sources: ALLEA (2023), COMETS (2020), WHO (2019), Science Europe (2015), and Martison, Anderson and de Vries (2005) who carried out a study with North American scientists, using concrete instances of scientists’ “questionable practices.” The examples of misconduct that we chose are those relevant to students who get to know research on and design of human-centred technologies and services for inclusive mobility.

¹⁵ DEFORM: <https://cordis.europa.eu/project/id/710246>

¹⁶ iThenticate: <https://www.ithenticate.com/resources/papers/research-misconduct> (accessed on 5 Sep. 2023)

Table 1 Examples of Research Misconduct

Research misconduct	Sources
Allowing funders, sponsors, or others to jeopardize independence and impartiality in the research process or unbiased reporting of the results	ALLEA (2023), p. 10
Misusing seniority to encourage violations of research integrity or to advance one's own career	“
Delaying or inappropriately hampering the work of other researchers	“
Misusing statistics, for example to inappropriately suggest statistical significance	“
Hiding the use of AI or automated tools in the creation of content or drafting of publications	“
Withholding research data or results without justification	“
Chopping up research results with the specific aim of increasing the amount of research publications	“
Citing selectively or inaccurately	“
Expanding unnecessarily the bibliography of a study to please editors, reviewers, or colleagues, or to manipulate bibliographic data	“
Manipulating authorship or denigrating the role of other researchers in publications	ALLEA (2023), p. 11
Establishing, supporting, or deliberately using journals, publishers, events, or services that undermine the quality of research ('predatory' journals or conferences and paper mills)	“
Participating in cartels of reviewers and authors colluding to review each other's publications	“
Misrepresenting research achievements, data, involvement, or interests	“
Accusing a researcher of misconduct or other violations in a malicious way	“
Ignoring putative violations of research integrity by others or covering up inappropriate responses to misconduct or other violations by institutions	“
Denying data access to colleagues	COMETS (2020), p. 11
Insufficiently documenting experimental protocols in manuscripts, making it impossible to other teams to reproduce the experiments	COMETS (2020), p. 13
Overestimation of the applicability of research findings	COMETS (2020), p. 14
Intentional misrepresentation of findings or research carried out by competitors	“
Deliberate omission of contributions made by other authors in the references	“
Incorrect indications on the progress of the researcher's own work with respect to publication	“
Addition of "guest" authors to the list of authors as a favour	“
Omission of anyone who made a significant contribution to the project from the list of authors	“
Mention of co-authors without their consent	“
Republication of parts of previous publications without citing the original source	“

Falsifying or “cooking” research data ¹⁷	Martinson et al. (2005), p. 737
Ignoring major aspects of human-subject requirements	“
Circumventing certain minor aspects of human-subject requirements	“
Using another’s ideas without obtaining permission or giving due credit	“
Unauthorized use of confidential information in connection with one’s own research	“
Failing to present data that contradict one’s own previous research	“
Overlooking others' use of flawed data or questionable interpretation of data	“
Changing the design, methodology or results of a study in response to pressure from a funding source	“
Publishing the same data or results in two or more publications	“
Inappropriately assigning authorship credit	“
Withholding details of methodology or results in papers or proposals	“
Using inadequate or inappropriate research designs	“
Dropping observations or data points from analyses based on a gut feeling that they were inaccurate	“
Inadequate record keeping related to research project	“
Inappropriate development of research protocol	WHO (2019), p. 3
Failure to disclose or take action on declared conflict of interest	“
Inadequate management of a research project	“
Sabotage—Copying of ideas, data or text (or various combinations of the three) without authorization or acknowledgement	“
Piracy—Deliberate exploitation of data from others without authorization	“
Failure to follow accepted procedures or exercise due care for avoiding unreasonable risk of harm to humans, animals or the environment	“
Mismanagement or inadequate preservation of data and/or primary materials	WHO (2019), p. 4
Misappropriation of data	“
Improper conduct in peer review	“
Misrepresentation of involvement or authorship	“
Failure to protect or the inappropriate use or disclosure of confidential or proprietary information, or the misuse of intellectual property	“
Improper dealing with allegations of wrongdoing	“
Not preserving primary data	Science Europe (2015), p. 5
Misuse of research funds for unauthorized purchase or for personal gain	“
Insensitivity to social or cultural norms	“

¹⁷ Cooking data is defined as creating a set of observations that will produce a known result, so this experiment appears to be a case of trimming data. Trimming data is defined as selecting data to make results look better (source: https://ori.hhs.gov/education/products/niu_authorship/mistakes/03mistake-c.htm, accessed on 4 September 2023)

In accordance with the French decree of 26 August 2022¹⁸, training in scientific integrity is mandatory for UPHF PhD students; this training is delivered through the UPHF Doctoral School¹⁹. Moreover, all new PhD recipients of French universities have to take an oath of research integrity at the end of the defence. The following text is pronounced individually:

“In the presence of my peers. With the completion of my doctorate in [research field], in my quest for knowledge, I have carried out demanding research, demonstrated intellectual rigour, ethical reflection, and respect for the principles of research integrity. As I pursue my professional career, whatever my chosen field, I pledge, to the greatest of my ability, to continue to maintain integrity in my relationship to knowledge, in my methods and in my results.”

(French Office for Research Integrity: <https://www.ofis-france.fr/faq-2/>, accessed on 14 Nov. 2023).

To summarize; your duties (not exhaustive)



Cite your sources (all of them...), including YOUR previous works on the same topics

Do not change / improve data

Describe clearly what has been done (must be repeatable, when possible)

Do not try to make the results better than they are

DO NOT TRUST in all published material (at least look for any retraction, comments about...)

DO NOT TRUST in your own results without a CRITICAL point-of-view, verify, verify again,

It is surely not enough, verify another time...

Do not accept being an author of a paper if you: do not agree with its content; did not participate to its elaboration

Do not accept reviewing when: you are NOT competent, you “know” (conflict of interests, i.e. published with, having been in the same research project...) the authors (except you have the approval of the editor AFTER having shared the information)

IMPORTANTLY (1): resist to pressures that are against scientific ethics: trials under pressure (economic, political interests...)

IMPORTANTLY (2): chose a GOOD journal, a GOOD conference

IMPORTANTLY (3): any doubt? ask a “trusted” senior or your “awesome”... RIS

Figure 3 Copy of a slide from the PhD course on scientific integrity at UPHF (Source: T. GUERRA, research integrity officer of UPHF)

In case of suspicion of a breach of scientific integrity, the contact is the university’s research integrity officer. At UPHF, the contact is ris@uphf.fr.

¹⁸ <https://www.legifrance.gouv.fr/jorf/id/JORFARTI000046228972>

¹⁹ UPHF Doctoral School: <https://www.uphf.fr/en/research/doctoral-school> (accessed on 15 Nov. 2023)

2 Integrity of Research: Concrete Illustrations

Integrity of research is concretely illustrated through the guidelines, regulations and procedures applied to researchers' activities.

Chapter 2 deals with research design and execution (§ 2.1), data management (§ 2.2), research involving human participants (§ 2.3), and intellectual property (§ 0) (see Figure 2).

2.1 Research Design & Execution

Research design is the set of strategies and actions that are planned to make concrete an idea of research (Cheek, 2008), it is the logical plan for getting from those questions to the answers about the questions (Yin, 2014). The research design directs then the selection of guidelines, regulations and procedures to be followed from the initial questions to the conclusions (Creswell & Creswell, 2018). The drawing and execution of such a plan should, of course, follow the principles of research integrity. We consider here the design of research question (§ 2.1.1) and research protocol (§ 2.1.2), data collection (§ 2.1.3), data analysis (§ 2.1.4), and, last, the activities of publishing and reviewing (§ 2.1.5).

2.1.1 Research Question

Generating the questions for research implies to deal with research integrity from the first step of the plan, that is:

- Thinking in terms of putting people and planet first (UN Environment Programme, 2023);
- Identifying who does the research question matter for most (Calia et al., 2019, The University of Edinburgh²⁰);
- Ensuring that the research question will not lead to unresolvable ethical problems (Bernard, 2006);
- Considering potential harms and risks relating to the considered research and its applications and mitigating possible negative impacts (ALLEA, 2023);

²⁰ The University of Edinburgh—An Ethical Research Journey: <https://www.ethical-global-research.ed.ac.uk/toolkit/research-journey> (accessed on 11 Sept. 2023)

- Considering together possibilities for addressing or minimizing possible harm and for maximizing potential benefits of the research question (Calia et al., 2019, The University of Edinburgh²⁰), which is particularly important when the participants are vulnerable, such as older persons are (Szala-Meneok, 2009);
- Considering the potential legacy of the research question in the future (Calia et al., 2019, The University of Edinburgh²⁰);
- Identifying the stakeholders who may have different vested interests in the research (ibid.);
- Remembering that “there are plenty of research questions that won’t put you into a moral bind” (Bernard, 2016, p. 82).



Source: pngegg.com

2.1.2 Research Protocols

- Designing protocols that consider the differences among research participants (age, gender, culture, religion, geographical location, etc.) (ALLEA, 2023);
- Examining whether there is conflict of interest between the benefit to the researcher and the research participants (Calia et al., 2019, The University of Edinburgh);
- Considering the issue of the recruitment and compensation regarding human participants²¹;
- With regard to the principle of ‘people and planet first,’ designing protocols that are respectful for the environment²² (Calia et al., 2019). For example, the US University of New Hampshire has proposed the **5—R’S Framework** for environmental responsibility in research: 1/**R**ecognizing that all research has environmental impacts; 2/ **R**efining questions and methods to minimize these impacts, for example, by using open-source data and coding platform; 3/**R**educing the amount of resources consumed (travel, scientific equipment energy, etc.); 4/**R**eplacing methods, techniques and materials with more sustainable options, e.g., options that contribute to less emission of greenhouse gases; and 5/**R**estoring

²¹ The University of Edinburgh– Ethical Action in Global Research: A Toolkit. <https://www.ethical-global-research.ed.ac.uk/6-data-collection-begins> (accessed on 12 Sept. 2023)

²² The University of Edinburgh– Ethical Action in Global Research: A Toolkit. Ethical principles and values: <https://www.ethical-global-research.ed.ac.uk/toolkit/ethical-principles-and-values> (accessed on 13 Sept. 2023)

the environment as it was before the study, e.g., by removing equipment (Murray et al., 2023);

- Distinguishing ethics procedures for adults from procedures for children and adolescents²³ (Calia et al., 2019);
- Acknowledging that there are mandatory legal procedures for research involving human participants and that related research protocols must be approved by research ethics committees. This point is broached in § 2.3.

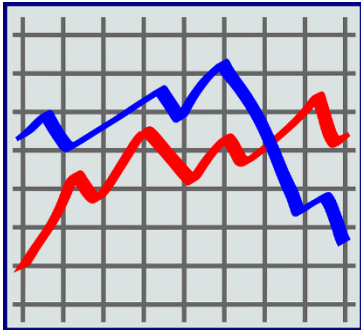
2.1.3 Data Collection

- Minimizing risks to the participants, which implies that the researcher understands these risks (Resnik, 2018), that is, “the potential physical or psychological harm, discomfort or stress to human participants that a research project may generate” (The British Psychology Society, 2014, p. 13). Such risks include simulator sickness;
- Fully informing the participant of potential risks (Mark, Eyssel, & Campbell, 1999);
- Considering the cost-benefit ratio when risk to the participant cannot be reduced without compromising the integrity of the study; but this approach has its limit, it depends on the nature and level of risk; moreover, benefits can be overestimated, whereas risks are underestimated, and “those who bear the costs may not reap the benefits” (ibid., p. 49);
- Paying attention to ‘imposter’ participants, e.g., in online surveys in Ridge et al. (2023);
- Ensuring that data collection process is likely to produce valid data consistent with the stated intent of the project²¹ (Calia et al., 2019);
- Ensuring that the research team is following the ethical protocol (Calia et al., 2019, The University of Edinburgh²⁰); the team includes the PhD and Master students;
- Informing research participants about how their data will be used, stored and deleted, in compliance with the European General Data Protection Regulation (ALLEA, 2023)
- And, of course, asking for permission before recording audio and video data from the participant;
- And respecting the rights and privacy of the sources of Web data collected for research;

²³ <https://rtc-cea.cepal.org/en/document/protocol-collection-and-dissemination-data-children-and-adolescents-participating-studies> (accessed on 12 Sept. 2023)

- In experimental studies, not stopping or continuing data collection based on the p -value (Chevassus-au-Louis, 2016/2019, Chapter 4 about researching for results);
- Keeping raw data, not destroying them;
- Not inventing data (it is a serious case of fraud, that of ‘fabrication’ (Ofis⁸; COMETS, 2020; ALLEA, 2023).

2.1.4 Data Analysis & Interpretation



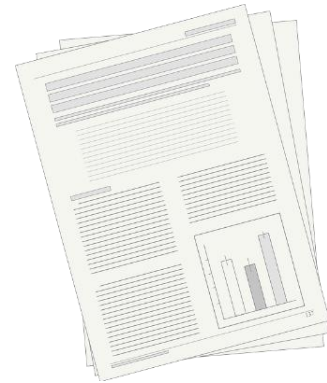
Source: pixabay.com

- Not inventing results (serious fraud of fabrication, see above);
- Not selecting or manipulating analysis data according to desired results: it is a basic rule in research. Otherwise, it is a matter of fraudulent falsification (Ofis⁸; COMETS, 2020; ALLEA, 2023);
- Similarly, not altering or discarding data that seem to be anomalous (Kromrey, 1993, p. 25);
- Not withholding research data or results without justification (ALLEA, 2023);
- Keeping the original unprocessed image data file safe and unchanged (ibid.);
- Applying statistical procedures without concern for a favourable outcome (Kromrey, 1993, p. 25);
- Not misusing statistics – e.g., to inappropriately suggest statistical significance (ALLEA, 2023);
- Not confounding probability level and the strength of relationships (ibid.);
- According consideration to “negative” results –i.e., results that do not match expectations or hypotheses (Chevassus-au-Louis, 2016/2019); “identifying blind alleys can be as important as unlocking new doors” (Wilcox, 2014, p. 165);
- Not presenting a post hoc hypothesis as if it were an a priori hypothesis (see Kerr, 1998, about “HARKing,” i.e., Hypothesing After the Results are Known);
- Not suppressing contradictory results (Kromrey, 1993, p. 25);
- Not changing results in response to pressure from a funding source (Martison et al. (2005);

- Considering the best way to present results that benefit as many people possible²⁴ (Calia et al., 2019);
- Thinking about immediate, short-term and long-term impacts when considering how to interpret the results (ibid.);
- And thinking beyond the scientific community, for example, how these results can affect the lives of participants and their communities (ibid.).

2.1.5 Publication

This section provides guidelines for publishing and reviewing. Publishing deals with the preparation of manuscripts, the issue of authorship, and the issues related to the selection of a journal for manuscript submission. Reviewing articles concerns the task per se; it is not developed because the present document is mainly dedicated to students.



Source: pixabay.com

2.1.5.1 Publishing

Most of the guidelines are taken from Table 1 (ALLEA, 2023; COMETS, 2020; WHO, 2019; etc.). Other sources are mentioned.

- Reporting the software used to collect and/or analyse the data;
- Mentioning any use of AI – e.g., ChatGPT – in the manuscript preparation (Rahimi & Abadi, 2023; Thorp, 2023);
- Not copying parts of others' ideas, texts, results, images without authorization or acknowledgement (plagiarism);
- Not withholding details of methodology or results;
- Not copying results of own's previous articles without mention of it;
- Not publishing the same data or results in two or more publications;
- Not slicing the research results with the aim of multiplying publications (e.g., Eva, 2017);
- Not beautifying images (Cromeey, 2010);

²⁴ <https://www.ethical-global-research.ed.ac.uk/8-data-analysis-and-interpretation> (accessed on 14 Sept. 2023)

- Not overestimating the applicability of research findings (COMETS, 2020);
- Not misrepresenting research achievements, data, involvement or interests;
- Not citing selectively or inaccurately;
- Not expanding the list of references to please reviewers or colleagues;
- Meeting at least one of the following criteria for authorship: significant contribution to the research design, data collection, data analysis and/or interpretation; drafting and/or critical reviewing of the manuscript; approval of the final publication; agreeing to be responsible for the content of the manuscript (e.g., ALLEA, 2023, p. 8);
- Agreeing on the sequence of authorship;
- Not manipulating authorship or denigrating the role of other researchers in publications;
- Not omitting the contributions made by other authors in the list of authors;
- Not adding honorary authors in the list as a favour;
- Properly disclosing any conflict of interest;
- Properly disclosing sources of support for the research or the publication (ALLEA, 2023);
- Paying attention to the so-called hybrid journals for the question of article processing charges to be published on open access by a subscription-based journal, which is thus a form of double payment for the article (CNRS, 2019; CNRS, 2022²⁵);
- Paying attention to not submit to predatory academic journals or conferences. Figure 4 shows the features of predatory journals, from the InterAcademyPartnership (IAP, 2022). IAP also provides the features of predatory academic conferences.

Grudniewicz et al., (2019). Predatory journals: no definition, no defence. *Nature*, vol. 576, p. 211

The definition

The consensus definition reached was: "Predatory journals and publishers are entities that prioritize self-interest at the expense of scholarship and are characterized by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices."

²⁵ The CNRS encourages its scientist to stop paying to be published, an interview of Prof. Alain Schuhl, April 07, 2022: <https://www.cnrs.fr/en/cnrsinfo/cnrs-encourages-its-scientists-stop-paying-be-published> (accessed on 28 Sept. 2023)

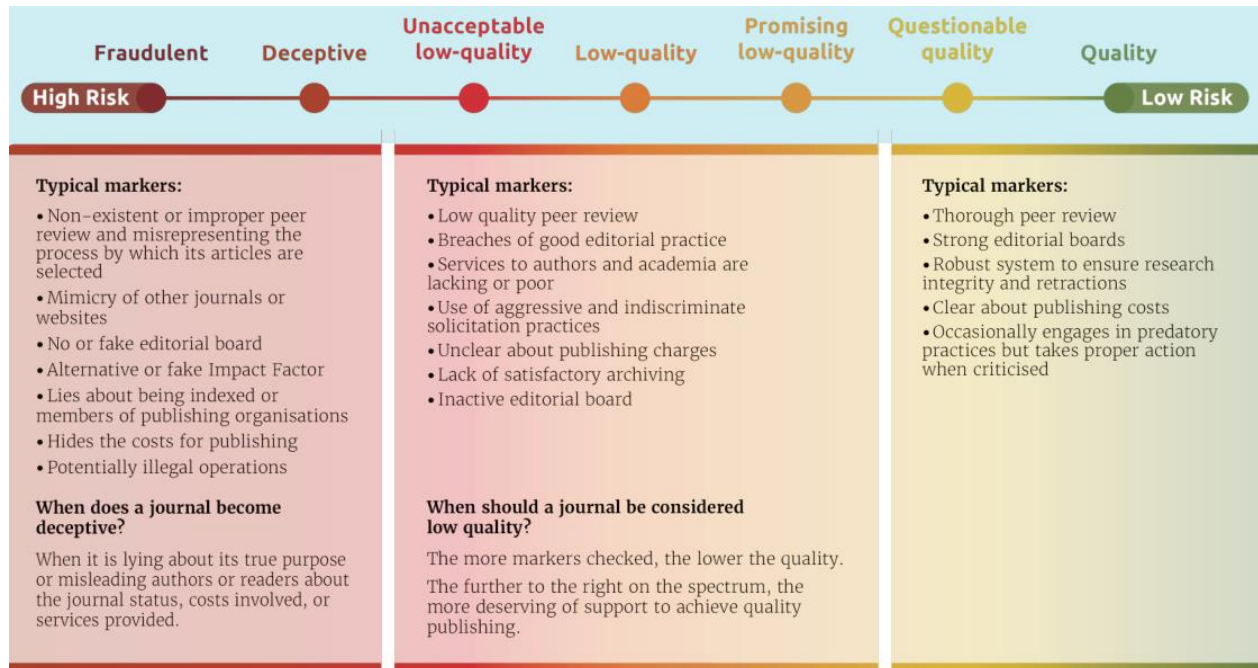


Figure 4 The IAP's Spectrum of predatory behaviours for journals. Source: IAP, 2022, p. 7

- Using preprint servers to deposit manuscripts submitted to journals (e.g., hal.science²⁶, arXiv²⁷). This is requested for research projects funded by National research agencies, as well as the European;
- Promptly notifying the journal's editors "when authors discover significant errors or inaccuracies in their own published work" and cooperating to correct the paper or retract it²⁸.

2.1.5.2 Reviewing

- Declining invitations to review in case of conflict of interest or feeling of being unqualified to perform the review;
- Declining invitation to review for predatory journals or conferences;

²⁶ <https://hal.science/>

²⁷ <https://engineering.library.cornell.edu/database/arxiv-org/>

²⁸ Open Edition Journals. *Question de Communication. Publication Ethics and Malpractice Statement*. <https://journals.openedition.org/questionsdecommunication/11404#tocto2n14> (accessed on 29 Sept. 2023)

- Not uploading a submitted manuscript or any part of it into a generative AI tool²⁹, it may infringe the authors' rights and/or the GDPR if the article contains personal data;
- Not using generative AI or AI-assisted technologies to help reviewing;
- Being alert to potential ethical issues including similarities or overlapping between the manuscript and other published articles.

2.2 Management of Research Data & Publications

The management of research data obeys to two different rationales, i.e., open data with open science and mandatory data archiving. From the legal standpoint, the latter is in France an application of the French Heritage Code (*Code du patrimoine*³⁰), as it is explained by Henry (2023). It is important to understand that temporary or long-term storage is not archiving; “storage includes data persistence, identification, indexing and optimization of access for frequent intensive processing whereas archiving involves the preservation of data for legal or historical reasons” (CNRS, 2021, p. 4).

Research data are defined by Pampel et al. (2013)—within the framework of research data repositories—as “digital data being a (descriptive) part or the result of a research process; research data also include source codes and software (CNRS, 2019).

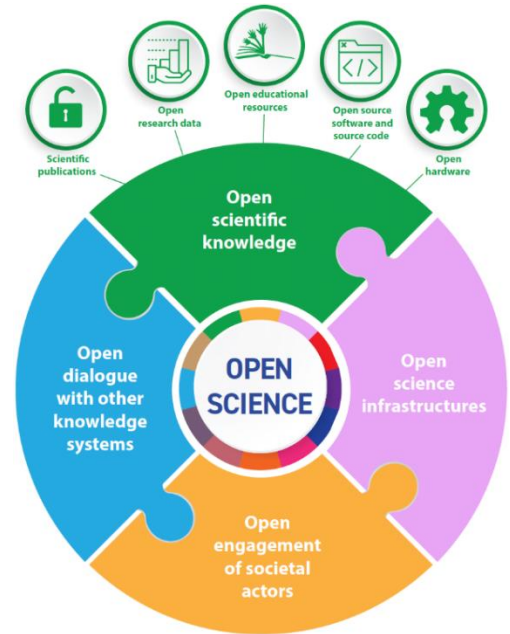
Research archives are made up of all the documents and data produced or received as part of the research process; they are public archives that no one has the right to delete without the consent of the archives department of the university. The researcher is responsible for them until they are deposited in the archives department when he/she no longer needs them.

Data archiving is managed at UPHF by the Service of Archives (archives@uphf.fr).

²⁹ Elsevier. Publishing ethics—Duties of reviewers. <https://beta.elsevier.com/about/policies-and-standards/publishing-ethics?trial=true#3-duties-of-reviewers> (accessed on 29 Sept. 2023)

³⁰ Code du patrimoine: https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006074236/

Open science is a wide international movement in the world of scientific research. It has started more than 30 years ago but its development has been accelerated with the deployment of the Web (CNRS, 2019). The European Open Science Cloud (EOSC) is precisely one of the actions of the policy agenda 2022–2024 of the European Research Area³¹. According to the Second French Plan for Open Science³², “open science refers to the unhindered dissemination of results, methods and products for science research” to: “democratize access to knowledge,” be “a lever for scientific integrity” and “build citizen trust in science” (p. 7). In concrete terms, open science makes it possible, under specific



Source: UNESCO (2021), p. 11

conditions, the access, re-use, repurpose, adaptation, and distribution of scientific publications, research data, metadata, educational resources, software, and source code and hardware, immediately or as quickly as possible, free of charge and regardless of location, nationality, income, career stage, discipline, language, disability, migratory status, etc. (UNESCO, 2021, p. 9.) Clearly, implementing open science benefits both science and citizens. Table 2 provides a general idea of the 12 measures for open science described in the Second French Plan³²; for complete descriptions, refer to the Plan. Table 2 shows that open science has many facets, but we focus in the present work on the openness of both publications and research data.

Table 2 The main measures of the 2021 Second French Plan for Open Science

Generalizing open access to publications	Generalizing the obligation to publish in open access all articles and books resulting from publicly funded calls for proposals
	Supporting open access economic publishing models that do not require the payment of articles or books processing charges
	Encouraging multilingualism and the circulation of scientific knowledge by translating publications by French researchers

³¹ https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science_en (accessed on 20 Oct. 2023)

³² French Ministry of Higher Education, Research and Innovation (2021). *Second French Plan for Open Science*. Retrieved from: <https://www.enseignementsup-recherche.gouv.fr/en/second-french-plan-open-science-87949> (accessed on 4 Oct. 2023)

Structuring, sharing and opening up research data	Implementing the obligation to disseminate publicly funded research data
	Creating the federal National platform for research data Recherche Data Gouv
	Promoting widespread adoption of data policies that cover the whole lifecycle of research data to ensure the FAIR principles
Opening up and promoting source code produced by research	Recognizing and support the dissemination under an open source licence of software produced by publicly funded research programmes
	Highlighting the production of source code from higher education, research and innovation
	Defining and promoting an open source software policy
Transforming practices to make open science the default principle	Develop and value open science skills throughout the educational and career pathways of students and research staff
	Value open science and the diversity of scientific productions in the assessment of researchers, of projects and of universities and research performing organizations
	Triple the budget for open science through the National Fund for Open Science and the Investments for the Future Programme

Like many universities, University Polytechnique Hauts-de-France and INSA Hauts-de-France have developed their own open science policy³³, as it was prescribed in the first National Open Science Plan in 2018³⁴.

The means of open science available at UPHF are managed by the [Research Support Department of the Common Documentation Service](#) of the university³⁵.

The [Data steering committee of UPHF](#) has defined UPHF's policy regarding the management of research data (that include research personal data). More precisely, this policy informs or reminds researchers, teaching researchers, engineers, technicians, as well as PhD candidates and postdoctoral researchers (contractual staff), about their rights, responsibilities and roles with regard to the production and management of research data. The policy also provides the necessary information relating to the services that manage each step of the data cycle at UPHF, as well as the legal references on which the committee relies.

³³ UPHF and INSA Hauts-de-France Open Science Plan: <https://www.uphf.fr/en/research/uphf-and-insa-hauts-france-open-science-plan> (accessed 12 Oct. 2023)

³⁴ French Ministry of Higher Education, Research and Innovation (2018). *National Plan for Open Science*. Retrieved from: https://cache.media.enseignement-sup-recherche.gouv.fr/file/Recherche/50/1/SO_A4_2018_EN_01_leger_982501.pdf (accessed on 4 Oct. 2023)

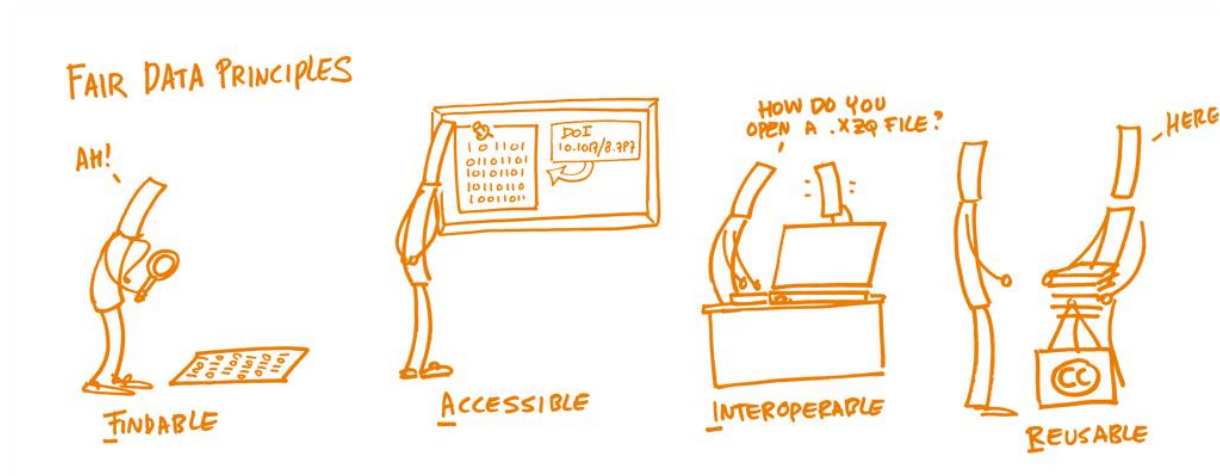
³⁵ UPHF-DAREC: https://bu.uphf.fr/opac/article/appui-a-la-recherche/f_appui_a_la_recherche (accessed on 19 Dec. 2023)

2.2.1 Management of Research Data for Open Science

Open research data means that data have no restrictions on their access, enabling anyone to access them³⁶. The means that allow such openness are described below through the FAIR data principles which underlie the openness of research data (§ 2.2.1.1), the data management plans describing how research data are managed along research projects (§ 2.2.1.2) and, last, research data repositories that store research data (§ 2.2.1.3).

2.2.1.1 FAIR Data Principles

Data could be easily reused for the benefit of various stakeholders if they were easy to find, accessible and interoperable (Mons et al., 2017). These four so-called FAIR principles (data findability, accessibility; interoperability, and reusability) are related, though independent and inseparable (Wilkinson et al., 2016).



Source: P. HOCHSTENBACH (University of Gent, Belgium). In Bezjak et al. (2018, p. 22). https://open-science-training-handbook.github.io/Open-Science-Training-Handbook_EN/ (accessed on 3 Oct. 2023)

³⁶ https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/open-science-monitor/facts-and-figures-open-research-data_en (accessed on 12 Oct. 2023)

Each of these foundational principles is declined into guiding principles. For example, one of the guiding principles of the foundational principle “reusable” is “R1. meta(data) are released with a clear and accessible data usage licence.”

A brief overview of the four principles is provided below, based on Wilkinson et al. (2016) and GO FAIR³⁷.

2.2.1.1.1 Findable

Findable means that data and metadata³⁸ are easy to find for both humans and machines, thanks to machine-readable unique and persistent identifiers (e.g., a DOI is a digital object identifier).

2.2.1.1.1 Accessible

Accessible means that data and metadata are long term preserved, easily retrievable using standardized protocols³⁹ and that metadata remain available even when data are no longer accessible.

2.2.1.1.2 Interoperable

Interoperable means that data and metadata are easily exchangeable between computer systems, thanks to openness and widely shared languages and formats.

2.2.1.1.3 Reusable

Reusable means that data and metadata are richly described for both humans and machines in terms of their source, original context, licence, etc. so that a machine is capable of deciding if a digital resource is relevant, if it can be reused, and under what conditions.

³⁷ GO FAIR: <https://www.go-fair.org/fair-principles/>

³⁸ “Metadata are the set of structured data describing physical or digital resources. They are an essential link in the chain for sharing information and ensuring the interoperability of electronic resources. They are traditionally divided into descriptive, administrative or structural metadata”. Retrieved from: INIST–CNRS (2016). Glossary. White Paper—Open Science in a Digital Library, p. 2. <https://doi.org/10.4000/books.oep.1653>

³⁹ A communication protocol can be defined as the set of rules that govern the exchange of information between processes in a communication system and it is realized by the software and hardware of the system (Shiratori et al., 1982, p. 403)

The respect of the FAIR principles regarding the data in a research project is one of the points of the data management plan.

2.2.1.2 Data Management Plans

A data management plan (DMP) describes how all data relating to a research project are treated along the data lifecycle, that is, before data are produced until after the project ends. It is a formal document that is mandatory for public funded research projects, for example, projects financed by the French National Research Agency (ANR) or Horizon Europe.

Available templates on the website of [DMP OPIDoR](#)⁴⁰ show that most of DMPs contain many fields requiring detailed information. However, to provide the reader with an idea of what is expected, we have chosen to present only the core requirements for data management plans proposed by Science Europe⁴¹. Science Europe considers that these requirements should serve as a homogeneous basis for all DMPs, in order to align data management policies among funding organizations, research organizations, and research communities. [Figure 5](#) presents the six core requirements and the 15 associated questions. Science Europe (2021) then details how to translate the core requirements into a DMP template, which we do not transcribe in the present document.

DMP OPIDoR stores many templates, including those for ANR and Horizon EUROPE projects at https://dmp.opidor.fr/public_templates⁴².

A DMP is often one of the deliverables of a research project and must be updated regularly as the project progresses; for these reasons, it is followed up and evaluated by the funding organization.

⁴⁰ DMP OPIDoR: <https://dmp.opidor.fr/static/examples> (accessed on 17 Oct. 2023)

⁴¹ Science Europe: <https://scienceeurope.org/about-us/> (accessed on 18 Oct. 2023)

⁴² Accessed on 18 Oct. 2023

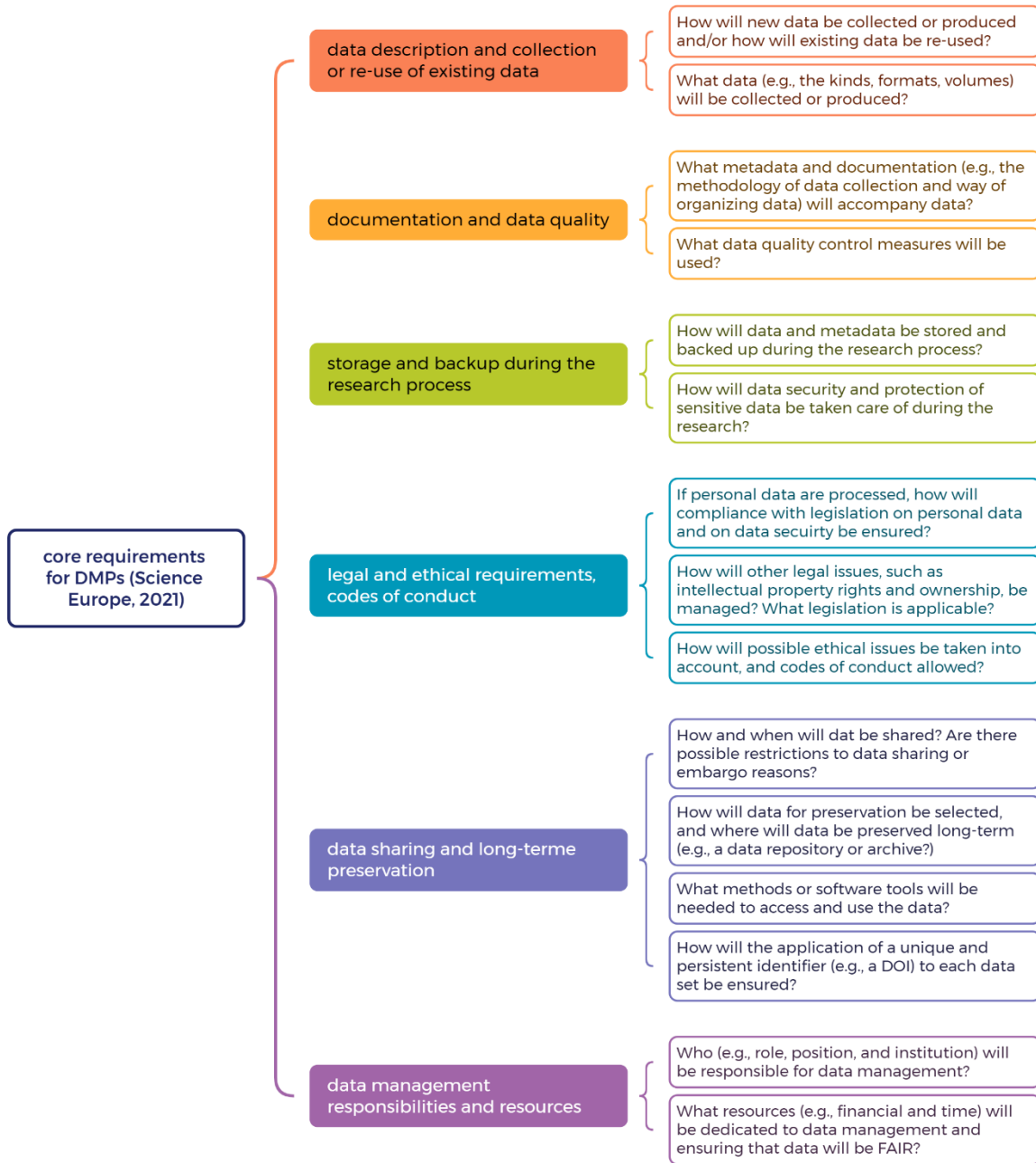


Figure 5 The Core Requirements for Data Management Plans according to Science Europe (Source: Science Europe, 2021, pp. 9–10). Xmind

2.2.1.3 Research Data Repositories

Figure 5 shows the importance of data repositories through the questions around the long-term preservation, sharing and re-use of research data. A research data repository is a “subtype of sustainable information infrastructure which provides long-term storage and access to research data” (Rücknagel et al., 2015; Strecker et al., 2023). Some data repositories can house software source code and software products under open source licence. Refer to Open Science (2022) regarding the openness of source code and software.

A registry of research data repositories covering different disciplines has been developed and made available online by re3data.org⁴³. It is dedicated to researchers, funding organizations, publishers, and scholarly institutions, and it orients their choice of a repository. The repositories are finely described, including meaningful icons that facilitate the first stage in selecting a research data repository (Figure 6 from Pampel et al., 2013).

The key element of a research data repository is metadata. A list of the metadata used by re3data.org to describe repositories are described in Strecker et al. (2023); they also provide the classification of the disciplines and subdisciplines that are covered in repositories.

[Zenodo](https://zenodo.org)⁴⁴ is among the research data repositories approved by Open Research Europe⁴⁵. Figure 7 is a screenshot of re3data.org concerning Zenodo and the repository that follows Zenodo on the list, which is Open-source Scientific Software and Service Repository (OSSR). Notice on the top—and middle right of the figure the icons of Figure 6, which provide basic information at a glance: both Zenodo and OSSR provide open access to their data, as well as the terms of use and licences of the

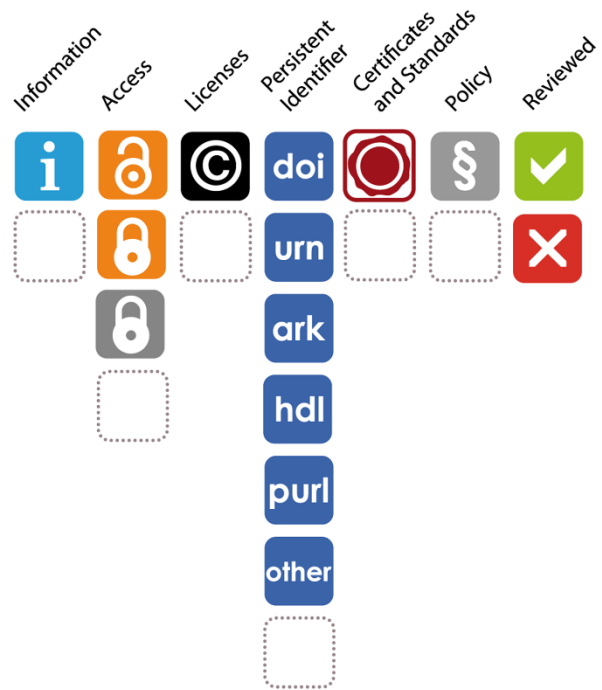


Figure 6 The re3data.org icon system depicting all possible values for each icon (Source: Pampel et al., 2013, <https://doi.org/10.1371/journal.pone.0078080>,

⁴³ www.re3data.org (accessed on 19 Oct. 2023)

⁴⁴ Zenodo: <https://about.zenodo.org/> (accessed on 19 Oct. 2023)

⁴⁵ Open Research Europe: <https://open-research-europe.ec.europa.eu/>

data, and both use DOI to make data persistent, unique and citable. Figure 7 also shows at a glance the disciplines covered by Zenodo and OSSR.

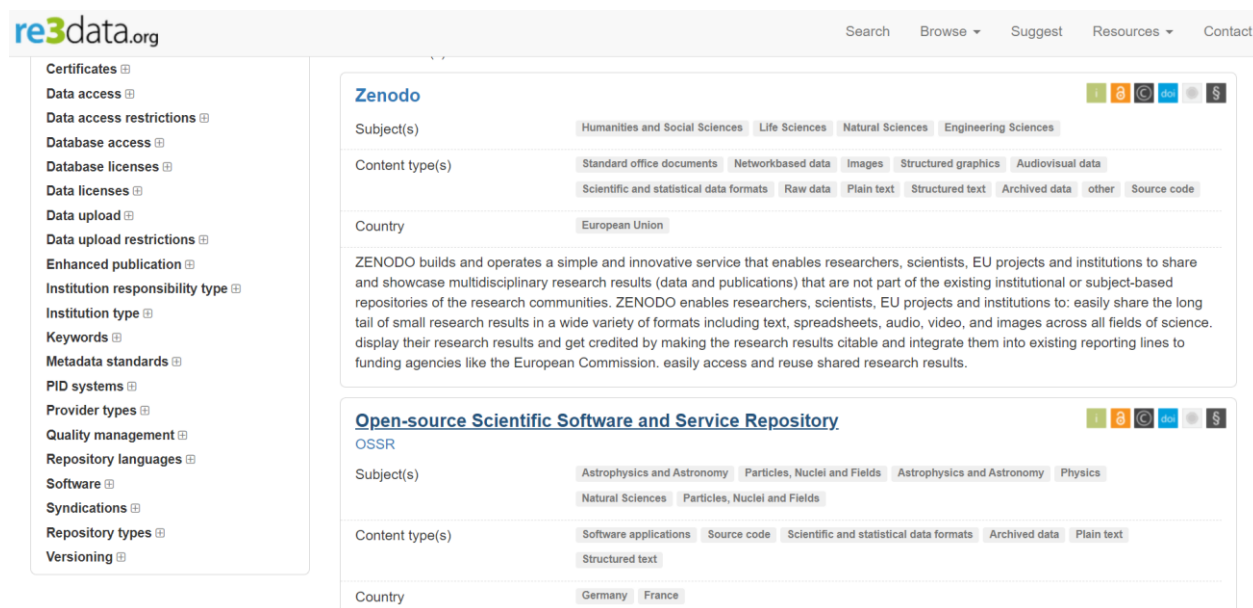


Figure 7 Screenshot of a webpage of re3data.org about Zenodo and OSSR (Source: <https://www.re3data.org/search?query=zenodo>, accessed on 19 Oct. 2023)

The French data repositories Recherche Data Gouv⁴⁶ and CNRS Research Data⁴⁷ are, of course, registered on re3data.org.

Recherche Data Gouv is part of the Second French Plan for Open Science³² (Table 2) This multidisciplinary “ecosystem for sharing and opening research data” includes data management clusters across France⁴⁸. It aims to be a service of the European hub of research data, tools and services for innovation and education, namely the European Open Science Cloud (EOSC)^{31,49}. The Recherche Data Gouv repository is concerned with the: curation⁵⁰, deposit and publication of approved final scientific data; check of deposited metadata and data files; opening, sharing and making data available for reuse. Moreover, Recherche Data Gouv offers researchers the

⁴⁶ Recherche Data Gouv: <https://recherche.data.gouv.fr/en> (accessed on 19 Oct. 2023)

⁴⁷ CNRS Research Data: <https://entrepot.recherche.data.gouv.fr/dataverse/cnrs> (ibid.)

⁴⁸ <https://recherche.data.gouv.fr/en/page/data-management-clusters-generalist-services-throughout-france> (accessed on 20 Oct. 2023)

⁴⁹ EOSC: https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/open-science/european-open-science-cloud-eosc_en (ibid.)

⁵⁰ i.e., “checking the metadata and data files deposited in the repository and, if necessary, suggesting modifications to improve the quality of the datasets”: <https://recherche.data.gouv.fr/en/glossary> (ibid.)

opportunity to make their research known by a wide audience through periodic highlights of datasets on the repository portal⁵¹. Notice that Recherche Data Gouv comprises data management clusters throughout France, including the institutional repository of UPHF.

The [CNRS Research Data repository](#) is part of the CNRS Research Data Plan (CNRS, 2021a). It is a space within Recherche Data Gouv, dedicated to the researchers who produce or co-produce data within a framework supported by CNRS and do not find a thematic or institutional repository adapted to their research field⁴⁷.

At UPHF, the contact regarding data management and stewardship is the [Research Support Department of the Common Documentation Service](#) of the university⁵² (donnees-recherche@uphf.fr), and for the units of CNRS, the [CNRS Research Data Support Team](#) (cnrs-researchdata@cnrs.fr).

The openness of research data may be required by some editors; it can be a way to combat the research misconduct of [Table 1](#).

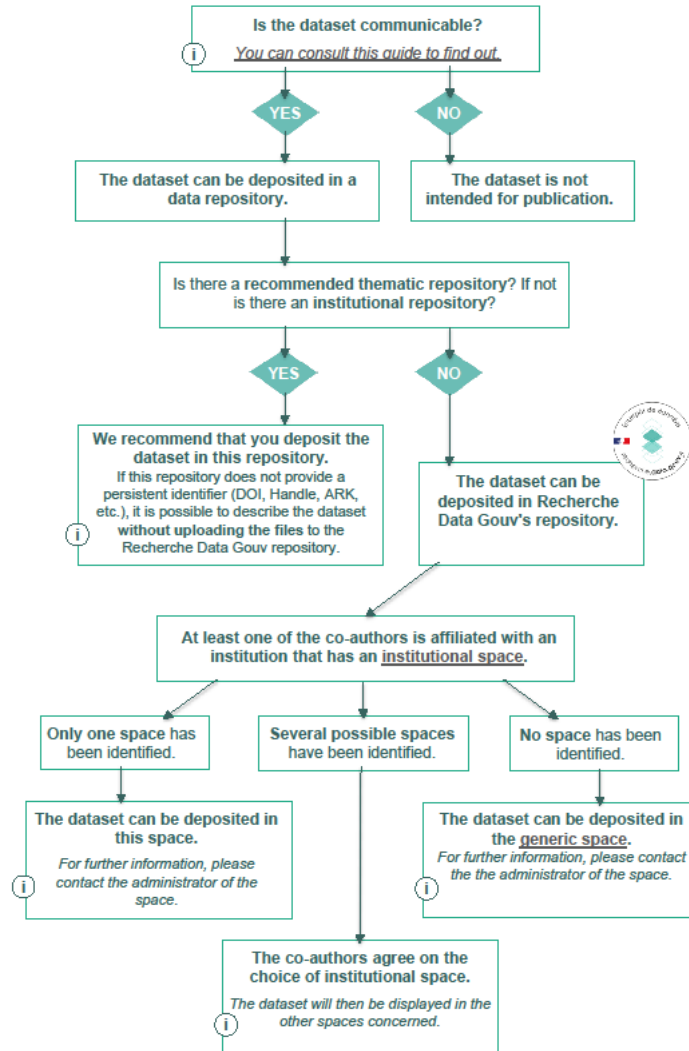
⁵¹ <https://recherche.data.gouv.fr/en/page/valuing-your-datasets> (accessed on 19 Oct. 2023)

⁵² <https://www.uphf.fr/en/research/uphf-and-insa-hauts-france-open-science-plan> (accessed on 20 Oct. 2023)



Where is the best place to publish your data?

This flowchart is designed to help people wishing to deposit data to identify where they can publish their dataset.



Flowchart proposed by Recherche Data Gouv to help researchers deciding where their data can be deposited. Source: https://s3.fr-par.scw.cloud/rdg-portal/uploads-guides/EN-Logigram_depositdata_white_dec23.pdf (accessed on 10 Jan. 2024)

2.2.2 Management of Publications for Open Science

Not only the openness of research data is a key constituent of open science, but also the openness of publications (UNESCO, 2021; the European Union's open science policy³¹; the Second French Plan for Open Access³²; the 2019 CNRS Roadmap for Open Science; and the UPHF and INSA Hauts-de-France Open Science Plan³³).

BU Bibliothèque Universitaire

Université Polytechnique
HAUTS-DE-FRANCE

INSA INSTITUT NATIONAL
DES SCIENCES
APPLIQUÉES
HAUTS-DE-FRANCE

VAL'OA

L'UPHF fait sa science ouverte !

Jeudi 14 décembre
> DE 9 H À 17 H

Un événement organisé
dans le cadre de l'Open Access Week 2023

- Présentations
- Table ronde
- Ateliers
- Serious games

servicechercheurs-bu@uphf.fr

Campus Mont Houy,
De 9 h à 13 h :
Bâtiment Matisse, Amphithéâtre 150
De 13 h à 17 h :
Bibliothèque Universitaire

www.uphf.fr

According to these institutions, the openness of publications means: generalizing the obligation to publish in open access the articles and books resulting from research financed by 50% to 100% of public funds; supporting the diamond model of open access economic publishing models, that is, publications are free of charge for authors and readers; and encouraging multilingualism in communications and publications to facilitate the circulation of scientific knowledge.

This chapter deals with open access publication, but also with open archives. Researchers and PhD students are encouraged to use both opportunities to make their work available to their communities and the public.

2.2.2.1 Open Archive

An open archive is an infrastructure where deposited articles can be consulted with neither authentication nor fees. They are either thematic (e.g., arXiv²⁷) or institutional, such as HAL open science²⁶—a non-commercial, multidiscipline platform open to worldwide researchers. Preprints are one of the types of deposit in HAL; a preprint (or prepublication or author’s version) is the version of a manuscript submitted to a journal, before the peer-reviewed process. A work that has not been submitted to a journal can be deposited in HAL as a working paper. Notice that there are many other open archives for preprints: for example, Preprint.org⁵³ is also a platform covering all research disciplines, and preprints are also posted online free of charge. Preprints.org requires that research data associated with a submission are available (if there are no legal or confidentiality). See COPE Council (2018) for a discussion about preprints and examples of other platforms.



Source : <https://hal.science/>

HAL also accepts poster communications, proceedings, books and book sections, scientific blog posts, reports, theses, software⁵⁴, and manuscripts accepted for publication. Self-archiving may require an embargo from the publisher: see the publisher’s policies regarding open access and/or the Sherpa Romeo portal⁵⁵. However, if both the European Union (EU) and, in France, the 2016

⁵³ <https://www.preprints.org>

⁵⁴ For more information on the openness of software, refer to Open Science, 2022

⁵⁵ <https://www.sherpa.ac.uk/romeo/> (accessed on 24 Oct. 2023)




French Law for a Digital Republic⁵⁶ limit the embargo to 6 months in science, technology and medicine, 12 months in human and social sciences⁵⁷ regarding publications resulting from public funded research, according to [cOAlition S](#), such publications should be made immediately available through open access repositories without embargo⁵⁸, with effect from 2021.

Getting back to HAL, visual and audio data produced as part of scientific research can be deposited in mediHAL⁵⁹. Most of deposits in HAL, mediHAL, HAL SHS⁶⁰ (dedicated to humanities and social sciences), HAL Thèses⁶¹ and its institutional portals (e.g., HAL-UPHF and its collections⁶²) are checked before they are published online. Refer to HAL Documentation for more details⁶³.

Note that [Open Research Europe](#)⁴⁵ is a platform that publishes open access articles resulting from projects funded by Horizon 2020 or Horizon Europe, based on rapid and transparent peer review of the published “preprint,” open peer review, indexation of articles (Scopus, etc.), editorial support, and no author fees.

The depositors in open archives have to know the different types of Creative Commons (CC) licences (Table 3), which are free of cost and available online [legal tools](#).

Table 3 Creative Commons Licences. Source: <https://creativecommons.org/share-your-work/cclicenses/>, accessed on 24 Oct. 2023

CC BY	BY: credit must be given to the creator	
CC BY-SA	BY: credit must be given to the creator SA: Adaptations must be shared under the same terms	
CC BY-NC	BY: credit must be given to the creator NC: Only noncommercial uses of the work are permitted	

⁵⁶LOI n° 2016-1321 du 7 octobre 2016 pour une République numérique : <https://www.legifrance.gouv.fr/loda/id/JORFT EXT 000033202746> (accessed on 24 Oct. 2023)

⁵⁷ <https://doc.archives-ouvertes.fr/en/legal-aspects/>

⁵⁸ <https://www.coalition-s.org/about/> (accessed on 25 Oct. 2023)




⁵⁹ <https://media.hal.science/>

⁶⁰ <https://shs.hal.science/>

⁶¹ <https://theses.hal.science/>

⁶² <https://uphf.hal.science/>, <https://uphf.hal.science/LAMIH>, <https://uphf.hal.science/LARSH>, <https://uphf.hal.science/INSA-HAUTS-DE-FRANCE>, etc.

⁶³ HAL Documentation: <https://doc.archives-ouvertes.fr/en/homepage/>

<p>CC BY-NC-SA</p>	<p>BY: credit must be given to the creator NC: Only noncommercial uses of the work are permitted SA: Adaptations must be shared under the same terms</p>	
<p>CC BY-ND</p>	<p>BY: credit must be given to the creator ND: No derivatives or adaptations of the work are permitted</p>	
<p>CC BY-NC-ND</p>	<p>BY: credit must be given to the creator NC: Only noncommercial uses of the work are permitted ND: No derivatives or adaptations of the work are permitted</p>	

2.2.2.2 Green, Gold, and Diamond Open Access Publication⁶⁴

❖ Depositing a postprint in an open archive – which makes it available for free to the public at large, immediately or after the respect of an embargo period – corresponds to what is called **Green Open Access**.

❖ **Hybrid Open Access** relates to “classic” journals⁶⁵ that offer the opportunity to be published open access if the manuscript is accepted, but with article processing charges (APCs). The model is then based on the institution subscription plus the payment of APCs by authors or their institution.

❖ **Gold Open Access** corresponds to the free online access to articles submitted to a fully open access journal without or with APCs: the model is based on either university library subscription (and authors do not pay) or APCs paid by the authors (or their institution). In fact, what is called

⁶⁴ Open access is multicoloured, see Barnes (2018), <https://doi.org/10.11647/OBP.0173.0089>

⁶⁵ i.e., articles are available via either institutional subscription to the journal publisher or unit purchase by the reader (or the institution)

Diamond Open Access refers to open access publication without APCs. Institutions recommend this model (cOAlition S⁶⁶).

❖ It is important to know that the **Directory of Open Access Journals (DOAJ)**⁶⁷ lists over twenty thousand of open access quality peer-reviewed research journals, two-thirds of which being published without APCs⁶⁸.

To conclude § 2.2, openness of research data, as well as self-archiving in open archive and open access to quality peer-reviewed journals that do not charge fees to either authors or readers are major ingredients of the integrity of research ecosystems:

- Researchers and PhD students may be impressed and attracted by the impact factor displayed by a journal, but, in fact, this quantitative metric will never reflect the quality of their work, it does not even ensure the quality of a journal. For instance, predatory journals (always golden open access with APCs) may use artificial impact factors: high impact factors do not mean that these journals publish quality articles. Notice that DOAJ does not approve of the use of impact factors to candidate⁶⁹;
- The Declaration on Research Assessment (DORA)^{70,71} and the European Coalition for



Source: <https://sfidora.org>

Advancing Research Assessment – see the Agreement on Reforming Research Assessment (CoARA, 2022) and the Leiden Manifesto (Hicks et al., 2015) – are working on qualitative indicators to

evaluate scientific



performance and combat the inappropriate use of quantitative metrics such as journal impact

Source: <https://coara.eu>

⁶⁶ <https://www.coalition-s.org/diamond-open-access/> (accessed on 25 Oct. 2023)

⁶⁷ <https://doaj.org>

⁶⁸ On 25 Oct. 2023, 18:20 (Paris time zone): 13,477 journals among 20,029 were journals without APCs

⁶⁹ <https://doaj.org/apply/guide/>

⁷⁰ DORA: <https://sfidora.org>

⁷¹ DORA Strategic Plan 2023-2026: <https://sfidora.org/wp-content/uploads/2023/03/DORA-Strategic-Plan-2023-2026-FINAL.pdf>

factors and h index⁷² (as well as the rank of research organizations) which reflect neither the quality of research practice at individual and research unit levels nor the scientific, technological, cultural and societal impacts of research activities. Good practices for research integrity extend to research assessment. Notice that [UPHF and CNRS are signatories of the CoARA's Agreement on Reforming Research Assessment](#);

- To return to the integrity of the researcher (§ 1), the abandon of the importance attached to quantitative metrics to refocus on producing useful and quality knowledge may reduce the pressure on researchers, which may reduce the temptation of research misconduct and help improve the quality of research impacts.

2.3 Research Involving Human Participants

We have seen in Rajaonah (2022, 2023) that designing human-centred technologies and services, human-machine systems, or socio-cyber-physical systems requires the human (end users, operators and/or other stakeholders) at almost all levels of the design process (Figure 8).

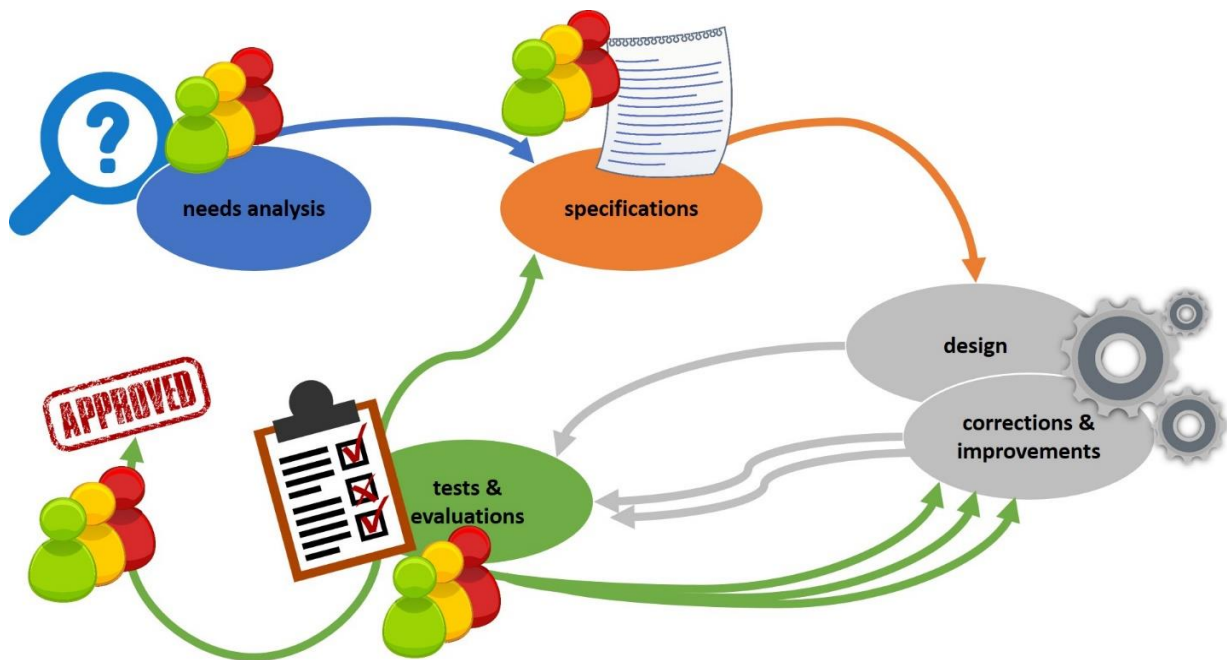


Figure 8 Human-centred approach: the human  is at almost all the steps of the design process (Source: Rajaonah, 2022, p. 33)

⁷² Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences*. <https://doi.org/10.1073/pnas.0507655102>.

In the present work, we focus on the human participant in non-biomedical research, a participant being “the person who serves as a data source for research” (Oates et al., 2021, p. 5). In any research study that involves such participants (for example, at the step of needs analysis or tests & evaluations in Figure 8, through questionnaires, interviews, computer simulations, eye tracking, etc.), two issues must be considered. One is the protection of the person in general, which in the European Union stems from the European Charter of Fundamental Rights⁷³ (European Commission, 2013). The other issue is the protection of personal data in particular, which in the European Union is regulated by the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)⁷⁴. The management of these two issues are considered in the ethics approval of research involving humans. European Commission (2021) provides a guidance that help applicants to EU projects check all ethical issues related to a particular research project; the document is useful to the researcher concerned by any study involving human participants, even though he/she does not want to apply to a European project.

2.3.1 Management of Personal Data: The GDPR

Personal data are defined by the European Parliament and the Council of the European Union in the context of the General Data Protection Regulation (GDPR) as:

- “Any information relating to an identified or identifiable natural person (‘data subject’); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person” (GDPR, Article 4 (1)).

The GDPR aims to give more control to the citizens of the European Union over their personal data; it protects them from breaches and violation of privacy, confidentiality and security of their

⁷³ Charter of Fundamental Rights of the European Union: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012P/TXT> (accessed on 31 Oct. 2023)

⁷⁴ GDPR: Official Journal of European Union, 4 May 2016, L 119/1: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R0679&from=EN#d1e1489-1-1> (accessed on 30 Oct. 2023)

personal data. In France, it is the French Commission on Information Technology and Liberties (CNIL)⁷⁵ who manages the compliance with both the French Loi Informatique et Libertés⁷⁶ and GDPR.

Concretely, the protection of personal data in research⁷⁷ means that researchers and/or their institution have to (i) inform the participants about why personal data are collected and what will happen to these data, (ii) ensure that the data are properly protected, minimized and destroyed when no longer needed, (iii) ensure that the compliance of data processing with the GDPR could be demonstrated at any time if it is requested by the participants, funding agencies or data protection supervisory authorities (European Commission, 2018).

- Data processing refers to “any operation or set of operations performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organization, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction” (GDPR⁷⁴, Article 4 (2)).
- The data controller (natural or legal person, public authority, agency or other body) determines the purposes for which and the means by which personal data is processed (why and how), whereas the data processor (natural or legal person, public authority, agency or other body) processes these data, on the behalf of the controller.
- Personal data can be anonymised, that is, personal data are converted into anonymised data by removing irreversibly all personal identifiers so that a person cannot be identified from data; data are considered as anonymous when they are anonymous to everyone, including the owner of data sources. Pseudonymisation consists in replacing a personal identifier with non-identifiable data (for example, by replacing a name with a number or an alias), but the participant can still be identified with additional information (for example, date of birth), hence additional information has to be kept separately from the data file to prevent from unwanted re-identification; pseudonymisation is not irreversible: data protection

⁷⁵ CNIL: <https://www.cnil.fr/en>

⁷⁶ <https://www.cnil.fr/fr/la-loi-informatique-et-libertes> (accessed on 30 Oct. 2023)

⁷⁷ For example, the steps of needs analysis and tests & evaluations of the human-centred design process (Figure 8) are often based on the collection of data that may be personal: such data fall under GDPR and, in France, the French Loi Informatique et Libertés

obligations still apply. Pseudonymisation is necessary when de-anonymisation may be needed over time.

The Belgium University KU Leuven provides detailed information on techniques of anonymisation and pseudonymisation of data research – including concrete examples – at: <https://www.kuleuven.be/rdm/en/guidance/legal-ethical/anonymise-pseudonymise#techniques> (accessed on 6 Oct. 2023).

- Data minimization is part of the measures that could achieve data protection by design: it consists in collecting only the data that are needed to meet research objectives and methodology (European Commission, 2018).
- Another measure is encryption, especially when it comes to process large scale of personal data. For more details about personal data and encryption within the framework of the GDPR, see Spindler and Schmechel (2016) and also KU Leuven⁷⁸.

Regarding data security, the European Commission (2018) recommends:

- Not to expose personal data to unauthorized access or use when accessing them remotely— for example, with unsecured Wi-Fi connections or travelling to countries where devices may be inspected.
- To comply with both the GDPR and national laws of non-EU member states where personal data are collected, for example, in case of collaborative research.
- Inform in advance the participants that their personal data will be transferred to a non-EU member state if it is envisaged in a project, in order to obtain their explicit consent.
- Check that third-party services such as survey tools, cloud storage and data analytics are incorporated in a European Union member state or legally represented in the European Union in accordance with the GDPR.

Among the recommendations of CNRS (2021b):

- Not use on-line survey tools hosted outside the European Union (e.g., Google Forms).
- Not exchange files containing so-called sensitive personal data by email without message encryption.

⁷⁸ See also KU Leuven: <https://admin.kuleuven.be/icts/english/research/datamgmtpract/ape/encryption> (accessed on 6 Nov. 2023)

- Share personal data in the context of open science only after they have been anonymised or with the consent of the data participants (an example of consent for the collection of personal data is given by CNRS (2021b, p. 30).

The European Commission provides a useful and practical online tool that helps researchers to determine whether or not their research project falls under the GDPR:

<https://ec.europa.eu/assets/rtd/ethics-data-protection-decision-tree/index.html> (accessed on 7 Nov. 2023).

For any question relating to the application of the GDPR, the contact at UPHF is the [Data Protection Officer](#) (dpd@uphf.fr); the UPHF Web portal regarding the protection of personal data: <https://www.uphf.fr/en/protection-personal-data> (accessed on 15 Nov. 2023). Notice that research personal data archiving is regulated by both the GDPR and the French Heritage Code; the contacts at UPHF are dpd@uphf.fr and archives@uphf.fr.

☞ It is important to point out that the CNIL⁷⁵ offers a free massive open online course (MOOC) on the GDPR⁷⁹ that not only students but also researchers can follow to better understand the challenges of data protection and the applications of the GDPR. They also can follow the MOOC offered by the French Cybersecurity Agency (ANSSI)⁸⁰ to understand and learn about cybersecurity-related risks and threats⁸¹. Those MOOCs are in French. Note that the European University for Customised Education EUNICE⁸² of which UPHF is a member proposes a virtual course in English on Cybersecurity⁸³.

2.3.2 Informed Consent

We have seen in the preceding chapter that the participants in a research project must be informed on why their personal data will be used if it is the case and how these data will be managed. In fact, involving human participants implies another obligation such as obtaining their written informed consent to participate in the research. Notice that informed consent is mandatory even in non-

⁷⁹ The MOOC 'L'Atelier RGD' is in French; register at <https://atelier-rgpd.cnil.fr/login/index.php>

⁸⁰ ANSSI: <https://cyber.gouv.fr/en/about-french-cybersecurity-agency-anssi>

⁸¹ The MOOC SecNumacadémie is in French; register at <https://secnumacademie.gouv.fr/auth/login>

⁸² EUNICE: <https://eunice-university.eu/> (accessed on 27 Nov. 2023)

⁸³ <https://eunice-university.eu/course/cybersecurity/> (ibid.)

biomedical research and even in a survey-based study. If the study includes potential risk, the risk must be mentioned in the consent form, for example, a risk of discomfort during a driving simulator-based study. The document must include at least a statement that the participant is voluntary and that he/she can withdraw their participation at any time.

2.3.3 Ethical Assessment of Research Project Involving Human Participants

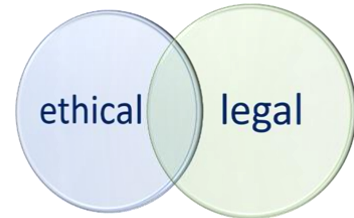
Regarding research carried out in France, the French Public Health Code distinguishes two categories of research involving human participants: research that extends biological or medical knowledge and research that does not. The first case refers to ‘RIPH’ (in French, *Recherche Impliquant la Personne Humaine*), whereas research that involves human participants but does not aim to increase biomedical knowledge can be called ‘non-RIPH’ (see Amiel et al., 2021). RIPH can be categorized into RIPH-1 (i.e., interventional research⁸⁴ that is not without risk to the participant), RIPH-2 (with minor risk), and RIPH-3 (without risk). Please, refer to Amiel et al. (2021) for detailed information about these categories. Amiel et al. underline the fact that research in behavioural sciences (including psychology) is not necessarily RIPH but it cannot be carried out without the supervision of a doctor who has appropriate expertise; also, even though research in neuroscience is in a sort of grey area between RIPH-3 and non-RIPH, using sensors does not imply that research falls under RIPH.

All non-RIPH projects do not require ethical examination before the project starts, but ethics approval may be asked by journal editors; in that case, a favourable ethical advisory opinion of a CER about the study can be necessary.

In France, two kinds of institutional organizations are concerned with the ethical evaluation of research projects.

⁸⁴ Avec actes pratiqués sur la personne

- The Committees for the Protection of Persons (CPP) are in charge of RIPH and are not concerned with non-RIPH. Their role is to assess the ethical dimensions of research protocols and decide whether or not the protocols can be ethically approved. A favourable opinion is mandatory for all RIPHs.
- The Committees for Research Ethics (CER) assess the ethicality of non-RIHP projects. The role of a CER is to offer an ethical advisory opinion from a research protocol. A list of French CERs is provided by the Federation of Committees (FF-CER)⁸⁵.



Researchers at UPHF can send their research protocols by email to: ethique-administration@univ-lille.fr. The protocol will be examined in order to decide whether it will be assessed by a CER or a CPP.

Notice that there are 39 CPP in France, but the researcher has not the possibility of choice: the CPP is assigned by drawing of lots (http://www.comite-de-protection-des-personnes-nord-ouest-iv-lille.sitew.fr/Depot_d_un_dossier_Avis_CPP.C.htm, accessed on 8 Nov. 2023).

Notice that besides ethical approvals from a CER or a CPP, any research in France involving personal data must follow the CNIL procedures⁸⁶ (at UPHF, the contact is dpd@uphf.fr).

⁸⁵ <https://www.federation-cer.fr/la-federation-des-cer/cer-affilies-a-la-federation/liste-des-cer,26362,43244.html> (Accessed on 8 Nov. 2023)

⁸⁶ References in French: https://www.cnil.fr/sites/cnil/files/atoms/files/recherche-hors-sante_principales-references-juridiques.pdf (acc. on 9 Jan. 2024) and <https://www.cnil.fr/fr/recherches-dans-le-domaine-de-la-sante-la-cnil-adopte-de-nouvelles-mesures-de-simplification> (acc. on 10 Jan. 2024)

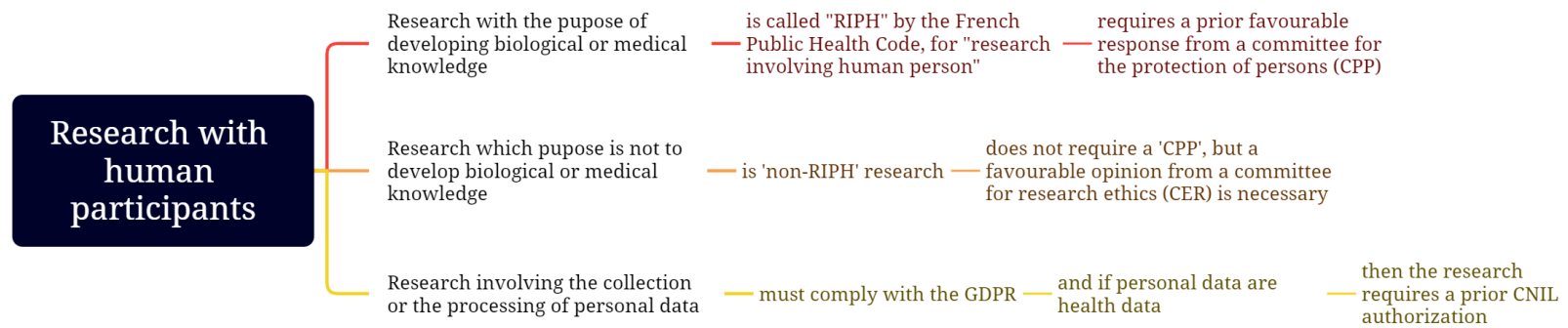


Figure 9 Research involving human participants in France: the obligations of researchers, in addition to their responsibility

2.4 Intellectual Property

In the academic field, intellectual property is the legal aspect of the activities of research and experimental development (R-D), which comprise “the creative and systematic work undertaken in order to increase the stock of knowledge (including knowledge on humankind, culture and society) and to devise new applications of available knowledge” (OECD, 2015). See Rajaonah (2023) for the different types of R-D activities according to the Frascati Manual 2015.

The main reference of this chapter is the [World Intellectual Property Organization \(WIPO\)](#)⁸⁷, which is an agency of the United Nations⁸⁸ and has 193 member states. The goal of WIPO is to lead the development of an intellectual property ecosystem that promotes creativity and innovation throughout the world, for the benefit of all. The means are cooperation with member states and with international organizations, such as the World Trade Organization (WTO)⁸⁹ and national organizations (for example, in France, INPI⁹⁰ and the companies of Technology, Transfer and Acceleration– the SATT network⁹¹).



Source: WIPO (2020)

[Intellectual property \(IP\)](#) refers to [creations of the mind](#)⁹², such as literary, artistic and scientific works, computer programs, inventions or industrial designs. [IP is protected by law](#). IP rights are divided into i) [author’s rights](#) – also named [copyright](#) in WIPO (2020) –, which protect the creative expression of ideas in many different forms (e.g., text, sculpture, computer program) and ii) [industrial property](#) protecting inventions, industrial designs, trademarks, geographical indications, and trade secrets (WIPO, 2020). **Software can be protected, either by copyright or by patent, the former protecting the content of the software, the latter the technical invention that results from the software.** Figure 10 shows at a glance those different facets of intellectual property (note that there may be differences according to the country). [Indeed, IP is governed by](#)

⁸⁷ WIPO: <https://www.wipo.int/portal/en/index.html>

⁸⁸ United Nations: <https://www.un.org/en/>

⁸⁹ WTO: <https://www.wto.org/index.htm> (accessed on 10 Nov. 2023)

⁹⁰ INPI: <https://www.inpi.fr/en/> (accessed on 10 Nov. 2023)

⁹¹ SATTs (Tech Transfer Acceleration Companies): <https://www.satt.fr/en/societe-acceleration-transfert-technologies/> (accessed on 10 Nov. 2023)

⁹² of the human mind

international and national laws, and, within the European Union, also by EU legislation⁹³, but a work published by the European Parliament has published, which compares copyright national laws across the EU⁹⁴ shows that author's rights do not have the same content for all state members. Notice that WIPO Web portal has a section dedicated to universities regarding intellectual property, especially with regard to knowledge transfer towards the economic sector: https://www.wipo.int/about-ip/en/universities_research/index.html (accessed on 10 Nov. 2023).

In principle, copyright protection starts from the moment the work is created, but a copyright notice can be attached to the work, such as “” all rights reserved” or the © symbol⁹⁵. The concept of author's rights is very important to ethical research: this legal concept explains why copying text without mentioning the source, omitting the contributions made other authors in the references, and manipulating authorship (Table 1) are infractions of research integrity.



The European Parliament “considers that works autonomously produced by artificial agents and robots might not be eligible for copyright protection, in order to observe the principle of originality, which is linked to a natural person, and since the concept of ‘intellectual creation’ addresses the author's personality”; the Parliament “recommends that ownership of rights, if any, should only be assigned to natural or legal persons that created the work lawfully and only if authorization has been granted by the copyright holder if copyright-protected material is being used, unless copyright exceptions or limitations apply” (The European Parliament, 2020)⁹⁶.

The contact regarding intellectual property rights at UPHF is the Research and Valorisation Department (DRV): <https://www.uphf.fr/en/research/research-uphf/valorization-research> (accessed on 13 Nov. 2023). CNRS Units can contact the CNRS Hauts-de-France office.

⁹³ https://europa.eu/youreurope/business/running-business/intellectual-property/index_en.htm (accessed on 14 Nov. 2023)

⁹⁴ European Parliament (2016). Copyright Law in the EU. <https://doi.org/10.2861/025158>

⁹⁵ <https://europa.eu/youreurope/business/running-business/intellectual-property/copyright/> (accessed on 14 Nov. 2023)

⁹⁶ European Parliament (2020). P9_TA (2020)0277: Intellectual property rights for the development of artificial intelligence technologies. European Parliament resolution of 20 October 2020 on intellectual property rights for the development of artificial intelligence technologies (2020/2015(INI)). Retrieved from: https://www.europarl.europa.eu/doceo/document/TA-9-2020-0277_EN.html (accessed on 15 Nov. 2023)

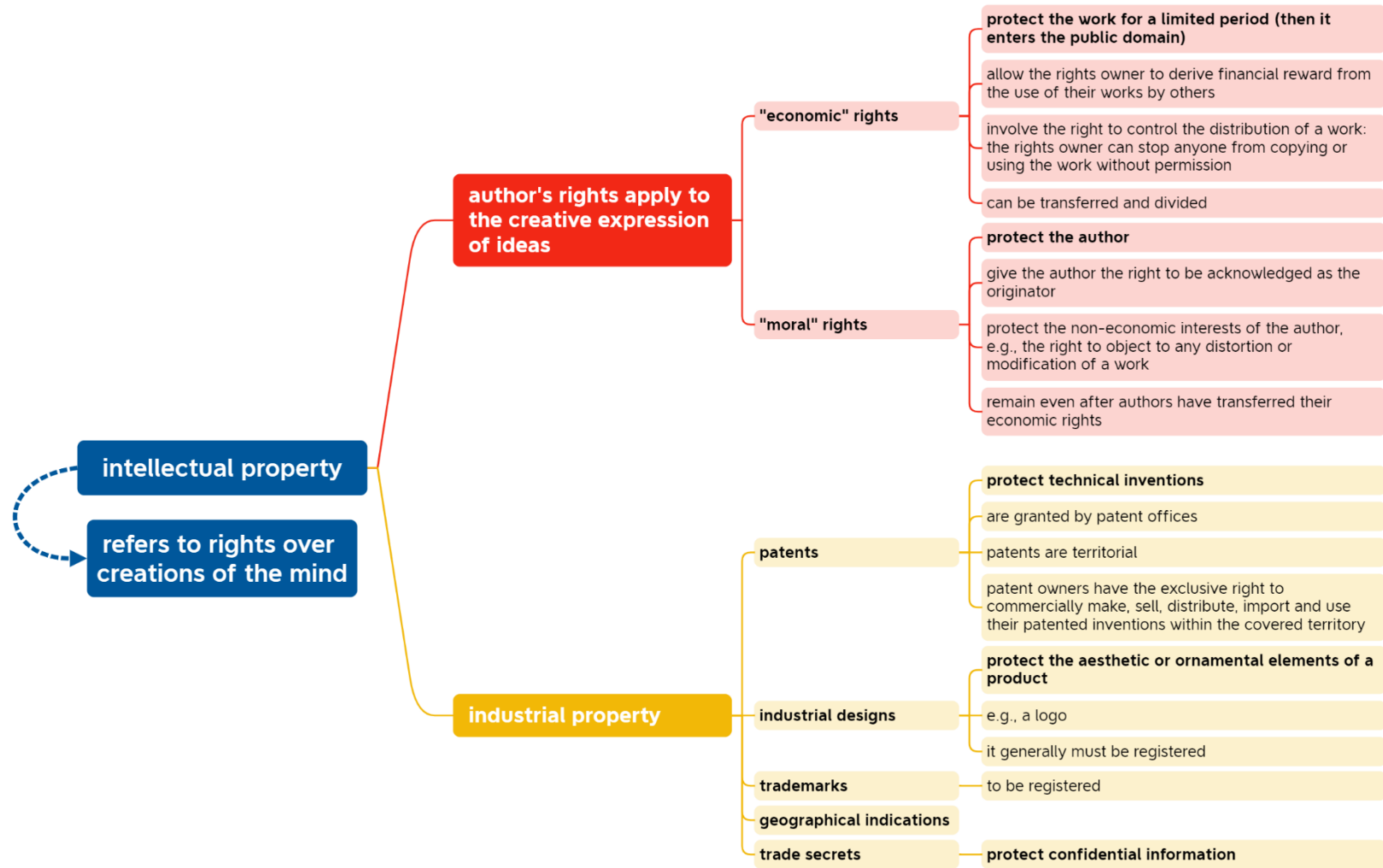


Figure 10 Intellectual Property according to the World Intellectual Property Organization (WIPO)

Both UPHF and CNRS Hauts-de-France work in partnership with SATT Nord. Indeed, the missions of SATTs are to support researchers by investing to transform research results into a future product or service, to find the best strategies for intellectual property and industrial transfer, and to guide research project to the creation of a startup⁹⁷.

As soon as a research project has the potentiality to generate an invention or a patentable software at UPHF, SATT Nord is involved. Because the present document is firstly dedicated to students, it mainly addresses the case of a UPHF student as an inventor: besides SATT Nord and UPHF-DRV or the CNRS regional office of Hauts-de-France ⁹⁸, the actors in a patent filing project are the inventors (the student and the supervisor-s) and the employer (UPHF, CNRS or a company) (Figure 11); the owners of intellectual property rights are determined according to the student's status (Figure 12).

It is essential to know that publishing about the research results that have led to the invention may jeopardize patent application.

Finally, we draw the attention of students at UPHF that the Hubhouse welcomes them to answer their questions about entrepreneurship and business creation; and that they can be coached: <https://www.uphf.fr/en/training/business/hubhouse> (accessed on 23 Nov. 2023).

HUBHOUSE
Oser - Imaginer - Entreprendre



Région
Hauts-de-France

<https://www.uphf.fr/en/training/business/hubhouse>

⁹⁷ <https://www.satt.fr/en/researchers/> (accessed on 22 Nov. 2023)

⁹⁸ <https://www.cnrs.fr/en/cnrs-regional-offices> (accessed on 23 Nov. 2023)

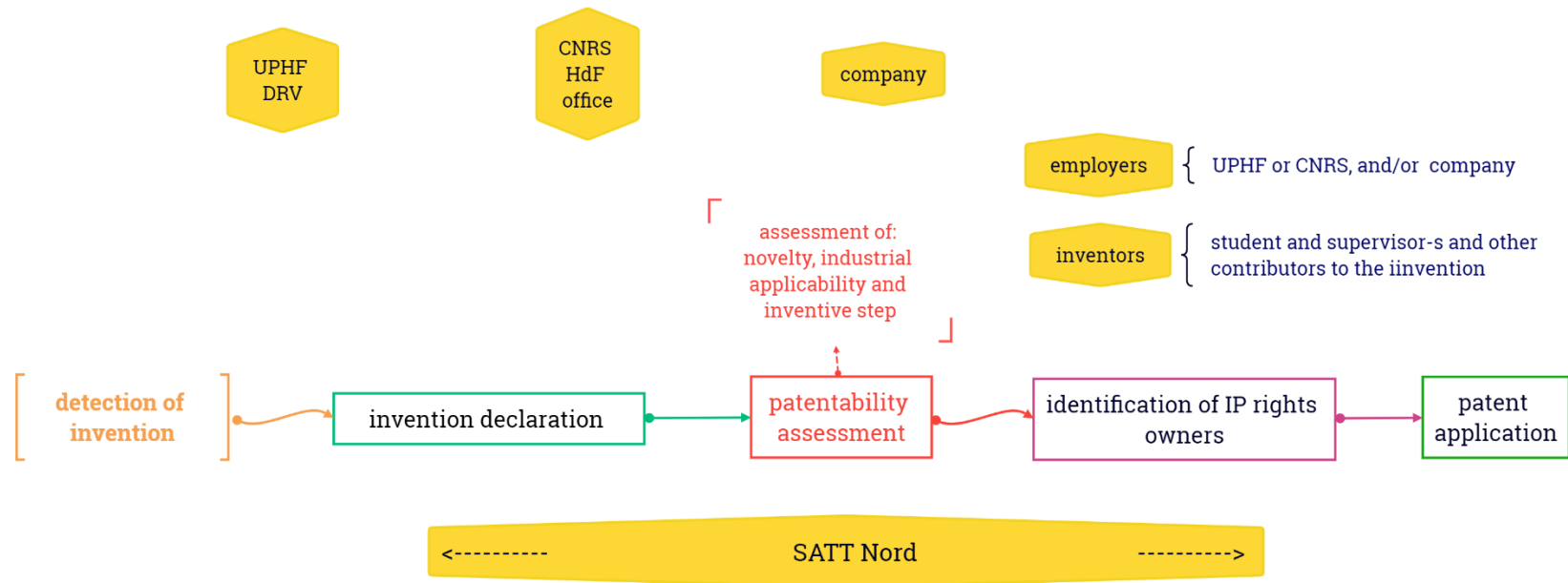


Figure 11 The main steps of a patent filing project at UPHF, with the main actors in yellow boxes

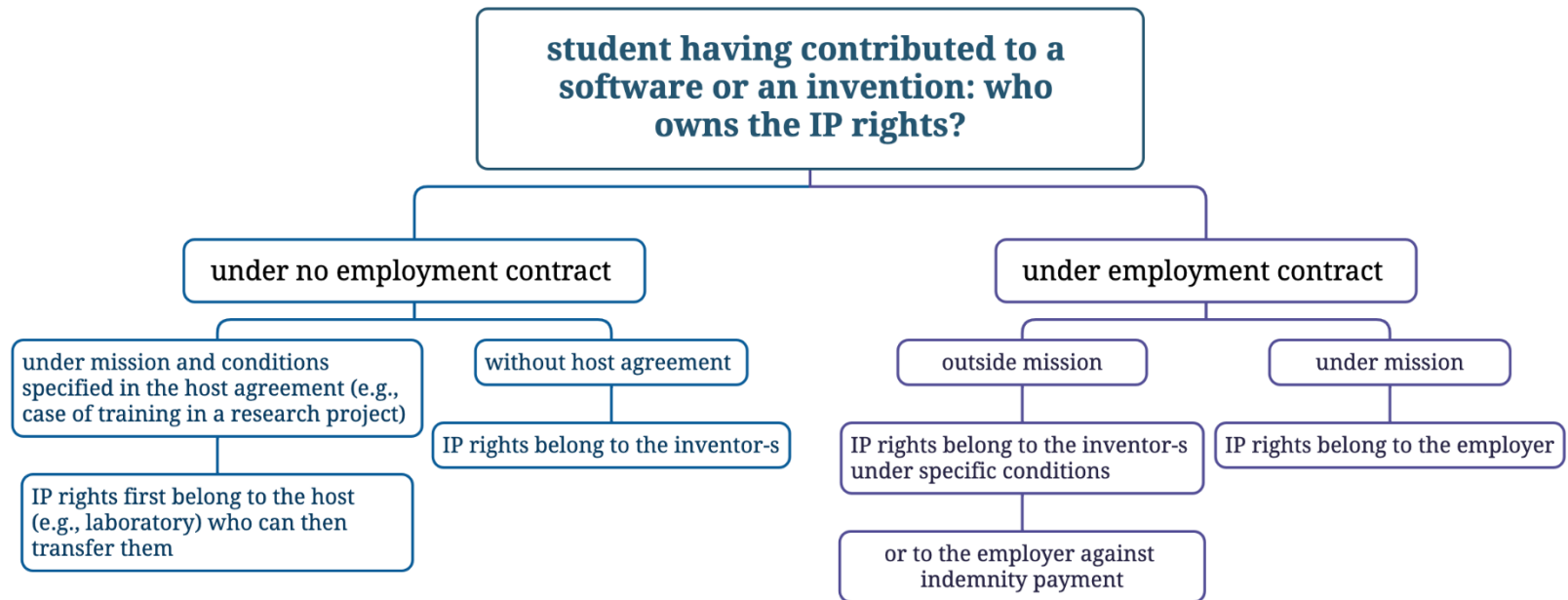


Figure 12 Who owns the intellectual property rights over an invention?

3 Acknowledgments

Thanks to Caroline Simon (UPHF–Development and Partnership Department), Mélissa Defond & Eva Goubert (UPHF–Research Support Department of the Common Documentation Service), Thierry Guerra (Research Integrity officer appointed by the French Office for Research Integrity⁹⁹), Guy Bisiaux (UPHF–Data Protection Officer), Christian Michel-Dansac (UPHF–Research and Valorisation Department), Sylvie Hanneke (UPHF–General Direction–Service of Archives).

4 References and Bibliography

- Al-Adawi, S., Ali, B. H., & Al-Zakwani, I. (2016). Research Misconduct: The peril of publish or perish. *Oman Medical Journal*, <https://doi.org/10.5001/omj.2016.02>.
- Alfaro-Toloza, P., Mayta-Tristan, P., & Rodriguez-Morales, A. J. (2013). Publication misconduct and plagiarism retractions: A Latin American perspective. *Current Medical Research and Opinion*, <https://doi.org/10.1185/03007995.2012.755504>.
- ALLEA (2017). *The European Code of Conduct for Research Integrity. Revised Edition 2017*. Berlin: All European Academies. Online: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/european-code-of-conduct-for-research-integrity_horizon_en.pdf (accessed on 14 June 2023).
- ALLEA (2023). *The European Code of Conduct for Research Integrity. Revised Edition 2023*. Berlin: All European Academies. <https://doi.org/10.26356/ECOC>.
- Amiel, P., Dosquet, C., & Comité d’Evaluation Ethique de l’Inserm (2021). *Guide de Qualification des Recherches en Santé* [A qualification guide for health research]. Paris: CEEI/IRB de l’Inserm. Retrieved from: https://comite-ethique.cnrs.fr/wp-content/uploads/2021/05/Inserm_GuideQualifCEEI_2021mai.pdf (Accessed on 8 Nov. 2023).
- ANR (2019). *Ethics and Scientific Integrity Charter of the ANR*. The French National Research Agency: <https://anr.fr/fileadmin/documents/2019/ANR-Ethics-and-Scientific-Integrity-Charter-2019-v2.pdf> (accessed on 21 August 2023).
- Bak, H. J. (2018). Research misconduct in East Asia’s research environments. *East Asian Science, Technology and Society: An International Journal*, <https://doi.org/10.1215/18752160-6577620>.
- Barnes, L. (2018). Green, Gold, Diamond, Black—what does it all mean? *Academic Publishing*. <https://doi.org/10.11647/OBP.0173.0089>.
- Bernard, H. R. (2006). *Research Methods in Anthropology. Qualitative and Quantitative Approaches* (4th ed.). Oxford, UK: Alta-Mira Press.
- Bezjak, S., Clyburne-Sherin, A., Conzett, P., Fernzandes, P. L., Göröh, E., Helbig, K., Kramer, B., Labastida, I., Niemeyer, K., Psomopoulos, F., Ross-Hellauer, T., Schneider, R., Tennant, J., Verbakel, E., Brinken, H., Heller, L. (2018). *The Open Science Training Handbook*. Retrieved from: https://open-science-training-handbook.github.io/Open-Science-Training-Handbook_EN/ (accessed 3 Oct. 2023).
- Bouter, L. (2023). Why research integrity matters and how it can be improved. *Accountability in Research*, <https://doi.org/10.1080/08989621.2023.2189010>.
- Breque, M., De Nul, L., Petridis, A. (2021). *Industry 5.0: Towards a Sustainable, Human-Centric and Resilient European Industry*. Luxembourg: Publications Office of the European Union.
- Broad, W., & Wade, N. (1987). *La Souris Truquée*. Paris : Editions du Seuil. Translated by Christian Jeanmougin from: Broad, W., & Wade, N. (1982). *Betrayers of the Truth*. New York: Simon and Shuster.
- Calia, C., Grant, L., Reid, C., & Guerra, C. (2019). *Ethical Action in Global Research: A Toolkit*. The University of Edinburgh. Available at: www.ethical-global-research.ed.ac.uk.
- Cheek, J. (2008). Research design. In: L. M. Given (Ed.), *The SAGE Encyclopedia of Qualitative Research Methods. Volume 1 & 2* (pp. 761-763). Thousand Oaks, CA: SAGE Publications.
- Chevassus-au-Louis, N. (2016). Malscience. *De la Fraude dans les Labos*. Paris : Editions du Seuil. English edition: Chevassus-au-Louis, N. (2019). *Fraud in the Lab. The High Stakes of Scientific Research* (translated by Nicolas Elliott). Cambridge, MA: Harvard University.

⁹⁹ OFLIS’s page directory of Research Integrity Officers: <https://www.ofis-france.fr/page-directory-of-research-integrity-officers-ris/> (accessed on 14 Nov. 2023)

- CNRS (2019). *CNRS Roadmap for Open Science*. https://www.science-ouverte.cnrs.fr/wp-content/uploads/2019/11/CNRS_Roadmap_Open_Science_18nov2019.pdf (accessed on 28 Sept. 2023).
- CNRS (2021a). *CNRS Research Data Plan*. https://www.science-ouverte.cnrs.fr/wp-content/uploads/2021/04/Cnrs_Research-Data-Plan_mars21.pdf (accessed on 19 Oct. 2023).
- CNRS (2021b). *InSHS. Humanities and Social Sciences and the Protection of Personal Data in the Context of Open Science. A Guide for Research*, Version 2. Retrieved from: https://www.inshs.cnrs.fr/sites/institut_inshs/files/pdf/Guide_rgpd_2021_en_0.pdf (accessed on 7 Nov. 2023).
- CoARA (2022). *Agreement on Reforming Research Assessment*, 20 July 2022. Retrieved from: <https://coara.eu> (accessed on 7 Nov. 2023).
- Collins (2018). *English Dictionary Complete and Unabridged* 13th edition. Glasgow, Scotland: HarperCollins Publishers.
- COMETS, CNRS Ethics Committee (2020). *Integrity and Responsibility in Research Practices. Guide*. <https://comite-ethique.cnrs.fr/wp-content/uploads/2020/09/COMETS-GUIDE-EN.pdf> (accessed on 21 August 2023).
- [COPE Council (2018). *COPE Discussion Document: Preprints* Version 1. Retrieved from: <https://publicationethics.org/resources/discussion-documents/preprints-march-2018> (accessed on 25 Oct. 2023).
- COPE Council (2021). *COPE Flowcharts and Infographics—Systematic Manipulation of the Publication Process* Version 2. <https://doi.org/10.24318/cope.2019.2.23>]
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Thousand Oaks, CA: SAGE Publications.
- Cromey, D. W. (2010). Avoiding twisted pixels: Ethical guidelines for the appropriate use and manipulation of scientific digital images. *Science and Engineering Ethics*, <https://doi.org/10.1007/s11948-010-9201-y>.
- Dubois, J. M. et al. (2013). Understanding research misconduct: A comparative analysis of 120 cases of professional wrongdoing. *Accountability in Research*, <https://doi.org/10.1080/08989621.2013.822248>.
- El Bairi, K., El Kadmiri, N., & Fourtassi, M. (2022). Exploring scientific misconduct in Morocco based on an analysis of plagiarism perception in a cohort of 1,220 researchers and students. *Accountability in Research*, <https://doi.org/10.1080/08989621.2022.2110866>.
- Eva, K. W. (2017). How would you like your salami? A guide to slicing. *Medical Education*, <https://doi.org/10.1111/medu.13285>.
- EUR-Lex (2016). *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)* (OJL 119, 4.5.2016, pp. 1–88). <http://data.europa.eu/eli/reg/2016/679/2016-05-04> (accessed 29 Sept. 2023).
- European Commission (2013). *Ethics for Researchers. Facilitating Research Excellence in FP7*. Luxembourg: Luxembourg: Publications Office of the European Union. Retrieved from: https://ec.europa.eu/research/participants/data/ref/fp7/89888/ethics-for-researchers_en.pdf (accessed on 31 Oct. 2023).
- European Commission (2018). *Ethics and Data Protection*. Retrieved from: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ethics-and-data-protection_he_en.pdf (accessed on 2 Nov. 2023).
- European Commission (2020). *Six Recommendations for Implementation of FAIR Practice*. Luxembourg: Publications Office of the European Union. <https://data.europa.eu/doi/10.2777/986252>.
- European Commission (2021). *EU Grants: How to Complete your Ethics Self-Assessment*. Retrieved from: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/how-to-complete-your-ethics-self-assessment_en.pdf (accessed on 8 Nov. 2023).
- Faucheux, S., Gans Combe, C., Kuszla, C., & O'Connor, M. (2019). In: Bartoli, A., Guerrero, J.L., Hermel, P. (Eds.), *Responsible Organizations in the Global Context. Current Challenges and Forward-Thinking Perspectives*. Cham, Switzerland: Palgrave Macmillan. https://doi.org/10.1007/978-3-030-11458-9_11.
- Grønhaug, K., & Olson, O. (1999). Action research and knowledge creation: Merits and challenges. *Qualitative Market Research*, <https://doi.org/10.1108/13522759910251891>.
- Grudniewicz, A. et al. (2019). Predatory journals: no definition, no defence. *Nature*, <https://doi.org/10.1038/d41586-019-03759-y>.
- Haven, T., Gopalakrishna, G., Tijdink, J., van der Schot, D., & Bouter, L. (2022). Promoting trust in research and researchers: How open science and research integrity are intertwined. *BMC Research Notes*, <https://doi.org/10.1186/s13104-022-06169-y>.
- Helgesson, G., & Bülow, W. (2023). Research integrity and hidden value conflicts. *Journal of Academic Ethics*, <https://doi.org/10.1007/s10805-021-09442-0>.
- Henry, C. (2023). Les archives scientifiques, cet objet insaisissable pourtant si convoité... *Ar(abes)ques*, <https://dx.doi.org/10.35562/arabesques.3511>.
- Hicks, D., Wouters, P., Waltman, L., De Rijcke, S., & Rafols, I. (2015). Bibliometrics: The Leiden Manifesto for research metrics. *Nature*, <https://doi.org/10.1038/520429a>.
- Horn, L., Alba, S., Gopalakrishna, G., Kleinert, S., Kombe, F., Lavery, J. V., & Visagie, R. G. (2023). The Cape Town Statement on fairness, equity and diversity in research. *Nature*, <https://doi.org/10.1038/d41586-023-00855-y>.
- Hosseinpour, R. M., Nevisi, R. B., & Sultani, A. N. (2023). A Search for a Common Thread: Iranian, Afghan, and Tajik EFL Students' Perceptions of Academic Misconduct. *Journal of Intercultural Communication*, <https://doi.org/10.36923/jicc.v23i1.91>.

- IAP (2022b). *Combatting Predatory Academic Journals and Conferences. Summary report*. The InterAcademy Partnership. Retrieved from: <https://www.interacademies.org/publication/predatory-practices-summary-English>.
- Jacobsen, A. et al. (2020). FAIR principles: interpretations and implementation considerations. *Data Intelligence*, https://doi.org/10.1162/dint_r_00024.
- Jonas, H. (1973). Technology and responsibility: Reflections on the new tasks of ethics. *Social Research*, 40(1), 31-54. <https://www.jstor.org/stable/40970125>.
- Keiski, R. et al. (2023). *The Finnish Code of Conduct for Research Integrity and Procedures for Handling Alleged Violations of Research Integrity in Finland*. Guideline of the Finnish National Board on Research Integrity TENK. Helsinki: Publications of the Finnish National Board on Research Integrity TENK 4/2023. https://tenk.fi/sites/default/files/2023-05/RI_Guidelines_2023.pdf (accessed on 28 August 2023).
- Kerr, N. L. (1998). HARKING: Hypothesizing after the results are known. *Personality and Social Psychology Review*, https://doi.org/10.1207/s15327957pspr0203_4.
- Khezzr, P., & Mohan, V. (2022). The vexing but persistent problem of authorship misconduct in research. *Research Policy*, <https://doi.org/10.1016/j.respol.2021.104466>.
- Kolstoe, S. E., & Pugh, J. (2023). The trinity of good research: Distinguishing between research integrity, ethics, and governance. *Accountability in Research*, <https://doi.org/10.1080/08989621.2023.2239712>.
- Kromrey, J. D. (1993). Research news and comment: Ethics and data analysis. *Educational Researcher*, 22(4), 24-27.
- Kuschel, L., & Dolling, J. (2022). Access to research data and EU copyright. *Journal of Intellectual Property, Information Technology and E-Commerce Law*. Retrieved from: <https://www.jipitec.eu/issues/jipitec-13-3-2022/5558> (accessed on 15 Nov. 2023).
- Liu, X., & Chen, X. (2018). Journal retractions: Some unique features of research misconduct in China. *Journal of Scholarly Publishing*, <https://doi.org/10.3138/jsp.49.3.02>.
- Mark, M. M., Eysell, K. M., & Campbell, B. (1999). The ethics of data collection and analysis. *New Directions for Evaluation*, <https://doi.org/10.1002/ev.1136>.
- Martínez-Ezquerro, J. D. (2023). Authors in the Age of Language-generation AI: To be or not to be, is that Really the Question? *Archives of Medical Research*, <https://doi.org/10.1016/j.arcmed.2023.03.002>.
- Martinson, B. C., Anderson, M. S., & De Vries, R. (2005). Scientists behaving badly. *Nature*, <https://doi.org/10.1038/435737a>.
- Mons, B., Neylon, C., Velterop, J., Dumontier, M., da Silva Santos, L. O. B., & Wilkinson, M. D. (2017). Cloudy, increasingly FAIR; revisiting the FAIR Data guiding principles for the European Open Science Cloud. *Information Services & Use*, <http://doi.org/10.3233/ISU-170824>.
- Murray, D. S., Cole, I., Nunez, N., Parker, E. M., Mikulis, A., Herreid, A. M., Mitchell, D., Fazekas, H. N., & Wymore, A. S. (2023). The environmental responsibility framework: a toolbox for recognizing and promoting ecologically conscious research. *Earth's Future*, <https://doi.org/10.1029/2022EF002964>.
- Oates, J. et al. (2021). *BPS Code of Human Research Ethics*. The British Psychological Society. <https://doi.org/10.53841/bpsrep.2021.infl80>.
- OECD (2015). *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development*. Paris: OECD Publishing. <http://dx.doi.org/10.1787/9789264239012-en>.
- OECD (2007). *Best Practices for Ensuring Scientific Integrity and Preventing Misconduct*. OECD Global Science Forum. Paris: OECD Publishing. <https://www.oecd.org/science/inno/40188303.pdf> (accessed on 25 August 2023).
- Okonta, P. I., & Rossouw, T. (2014). Misconduct in research: A descriptive survey of attitudes, perceptions and associated factors in a developing country. *BMC Medical Ethics*, <https://doi.org/10.1186/1472-6939-15-25>.
- Olesen, A. P., Amin, L., & Mahadi, Z. (2018). Researchers experience of misconduct in research in Malaysian higher education institutions. *Accountability in Research*, <https://doi.org/10.1080/08989621.2018.1429925>.
- Open Science (2022). *Source Code and Software*. Ministry of Higher Education and Research, Université de Lille, France. Retrieved from: <https://www.ouvri.lascience.fr/source-code-and-software/> (accessed on 24 Oct. 2023).
- Pampel, H. et al. (2013). Making research data repositories visible: The re3data.org registry. *PLOS One*, <https://doi.org/10.1371/journal.pone.0078080>.
- Patnaik, P. R. (2016). Scientific misconduct in India: Causes and perpetuation. *Science and Engineering Ethics*, <https://doi.org/10.1007/s11948-015-9677-6>.
- Pilat, D., & Fukasaku, Y. (2007). OECD principles and guidelines for access to research data from public funding. *Data Science Journal*, <https://doi.org/10.2481/dsj.6.OD4>.
- Rahimi, F., & Abadi, A. T. B. (2023). ChatGPT and publication ethics. *Archives of Medical Research*, <https://doi.org/10.1016/j.arcmed.2023.03.004>.
- Rajaonah, B. (2022). *Human-Centred Research & Design for Inclusive Mobility. Sections A & B* (Working document). Univ. Polytechnique Hauts-de-France, CNRS, UMR 8201 – LAMIH. <https://hal.science/hal-03726812>.
- Rajaonah, B. (2023). *Human-Centred Research & Design for Inclusive Mobility. Section C-Doing Science* (Working document). Univ. Polytechnique Hauts-de-France, CNRS, UMR 8201 – LAMIH. <https://uphf.hal.science/hal-04093130>.
- Renda, A., Schwaag Serger, S., Tataj, D. et al. (2022). *Industry 5.0, a Transformative Vision for Europe: Governing Systemic Transformations Towards a Sustainable Industry*. Luxembourg: Publications Office of the European Union.

- Resnik, D. B. (2018). *The Ethics of Research with Human Subjects: Protecting People, Advancing Science, Promoting trust*. Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-319-68756-8>.
- Ricoeur, P. (1989). L'éthique, la morale et la règle. *Autres Temps*, 24(1), 52-59.
- Ricoeur, P. (2000). De la morale à l'éthique et aux éthiques. *Divinatio*, no. 11, 31-42. Online: http://palimpsestes.fr/morale/Ricoeur_MORALE.pdf (accessed on 15 June 2023).
- Ridge, D. et al. (2023). 'Imposter participants' in online qualitative research, a new and increasing threat to data integrity? *Health Expectations: An International Journal of Public Participation in Health Care and Health Policy*, <https://doi.org/10.1111/hex.13724>.
- Rücknagel et al. (2015). *Metadata Schema for the Description of Research Data Repositories* Version 3.0. re3data.org. <http://doi.org/10.2312/re3.008>.
- Science Europe (2015). *Research Integrity: What it Means, Why it is Important and How we Might Protect it*. Briefing paper by Dr Maura Hiney, Chair of the Science Europe Working Group on Research Integrity. Brussels: Science Europe.
- Science Europe (2021). *Practical Guide to the International Alignment of Research Data Management—Extended Edition with DMP Evaluation Rubric*. Brussels: Science Europe AISBL. <https://doi.org/10.5281/zenodo.4915861>.
- Shiratori, N., Gohara, J., & Noguchi, S. (1982, September). A new design language for communication protocols and a systematic design method of communication systems. In *Proceedings of the 6th International Conference on Software Engineering ICSE '82* (pp. 403-412), Tokyo, Japan.
- Singh, S., & Remenyi, D. (2016). Plagiarism and ghostwriting: The rise in academic misconduct. *South African Journal of Science*, <http://dx.doi.org/10.17159/sajs.2016/20150300>.
- Spindler, G., & Schmechel, P. (2016). Personal data and encryption in the European general data protection regulation. *Journal of Intellectual Property, Information Technology and E-Commerce Law*. Retrieved from: https://www.jipitec.eu/issues/jipitec-7-2-2016/4440/spindler_schmechel_gdpr_encryption_jipitec_7_2_2016_163.pdf (accessed on 6. Nov. 2023).
- Steen, R. G. (2011). Retractions in the medical literature: how many patients are put at risk by flawed research? *Journal of Medical Ethics*, <http://dx.doi.org/10.1136/jme.2011.043133>.
- Stoeklé, H. C., Ivasevitch, A., & Hervé, C. (2023). Good practice in medicine and biology: scientific integrity needs global bioethics. *Journal of Translational Medicine*, <https://doi.org/10.1186/s12967-022-03847-0>.
- Strecker, D. et al. (2023). *Metadata Schema for the Description of Research Data Repositories* Version 4.0. <https://doi.org/10.48440/re3.014>.
- Szala-Meneok, K. (2009). Ethical research with older adults. In: D.M. Mertens & P.E. Ginsberg (Eds.), *The Handbook of Social Research Ethics*. Thousand Oaks, CA: SAGE Publications. <https://doi.org/10.4135/9781483348971>.
- Tanimoto, T., Kami, M., & Shibuya, K. (2013). Research misconduct and scientific integrity: A call for a global forum. *The Lancet*, [https://doi.org/10.1016/S0140-6736\(13\)61933-9](https://doi.org/10.1016/S0140-6736(13)61933-9).
- Tavare, A. (2011). Managing research misconduct: Is anyone getting it right? *The BMJ*, <https://doi.org/10.1136/bmj.d8212>.
- The British Psychological Society (2014). *Code of Human Research Ethics*. Working Party on Ethical Guidelines for Psychological Research. Leicester, UK: The British Psychological Society.
- Thorp, H. H. (2023). ChatGPT is fun, but not an author. *Science*, <https://doi.org/10.1126/science.adg7879>.
- UN Environment Program (2023). *For people and Planet: The UNEP Strategy for 2022-2025*. www.unep.org/resources/people-and-planet-unep-strategy-2022-2025 (accessed on 12 Sept. 2023).
- UNESCO (2021). *UNESCO Recommendation on Open Science*. Paris: United Nations Educational, Scientific and Cultural Organization.
- Vasconcelos, S. M. R. et al. (2023). Perceptions of plagiarism among PhDs across the sciences, engineering, humanities, and arts: Results from a national survey in Brazil. *Accountability in Research*, <https://doi.org/10.1080/08989621.2021.2018306>.
- Wilcox, A. J. (2014). A positive approach to negative results. *Epidemiology*, <http://doi.org/10.1097/EDE.0000000000000022>.
- WHO (2019). *Misconduct in Research*. Geneva, Switzerland: World Health Organization. Retrieved from: <https://www.who.int/about/ethics> (accessed on 24 August 2023).
- WIPO (2016). *Understanding Copyright and Related Rights* Second edition. Geneva, Switzerland: World Intellectual Property Organization. Retrieved from: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_909_2016.pdf (accessed on 10 Nov. 2023).
- WIPO (2018). *Understanding Industrial Property* Second edition. Geneva, Switzerland: World Intellectual Property Organization. Retrieved from: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_895_2016.pdf (accessed on 10 Nov. 2023).
- WIPO (2020). What is Intellectual Property? Geneva, Switzerland: World Intellectual Property Organization. <https://doi.org/10.34667/tind.42176>.
- Wilkinson, M. D. et al. (2016). The FAIR Guiding Principles for scientific data management and stewardship. *Scientific Data*, <https://doi.org/10.1038/sdata.2016.18>.
- Yin, R. K. (2014). *Case Study Research: Design and Methods* (5th ed.). Thousand Oaks, CA: SAGE Publications.

POURQUOI ARCHIVER VOS DOCUMENTS ?



- ✓ Pour disposer des **informations** dans l'exercice de vos activités
- ✓ Pour assurer la **continuité des activités**
- ✓ Pour pouvoir répondre aux besoins de la **justification des droits**
- ✓ Pour justifier de l'antériorité d'une **découverte en recherche**
- ✓ Pour sécuriser la **conservation des documents**
- ✓ Pour **libérer de la place** dans les bureaux
- ✓ Pour garder une **trace historique** de l'identité de l'établissement à travers ses **évolutions**

BESOIN D'UN CONSEIL SUR LA MANIÈRE D'ARCHIVER VOS DOSSIERS ?

Pour toute demande d'aide personnalisée, un **système de tickets** a été mis en place sur votre **ENT**, Rubrique « **Mon Bureau** » puis « **Demande d'intervention** », catégorie « **Service des archives** ».



DIRECTION GÉNÉRALE - SERVICE DES ARCHIVES

Sylvie Hanneke, responsable du service (poste 1017)

Marie Hernu, assistante archiviste (poste 1011)

archives@uphf.fr



www.uphf.fr