International guidelines on good governance practice for research institutions

Council for International Organizations of Medical Sciences (CIOMS)

Geneva 2023

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ISBN: 978-929036104-6

Suggested citation: International guidelines on good governance practice for research institutions. Geneva, Switzerland: Council for International Organizations of Medical Sciences (CIOMS), 2023. doi: 10.56759/hslk3269. Licence: CC BY-NC-SA 4.0

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This publication is freely available on the CIOMS website at: https://doi.org/10.56759/hslk3269

Design: Paprika, Annecy (France).

ACKNOWLEDGEMENTS

The Council for International Organizations of Medical Sciences (CIOMS) gratefully acknowledges the contributions of the members of the Working Group on Good Governance Practice for Research Institutions (see Annex 2) as well as the generous support from organizations and institutions which, by making available their experts and resources, facilitated the work that resulted in this publication.

Special thanks go to Dominique Sprumont, who chaired the Working Group meetings during the entire duration of the project, for his dedication and leadership. CIOMS acknowledges his involvement in the drafting of the concept paper, the initialization of the project, and for his active follow-up and input throughout the project including its editorial phase.

In the course of the project, new members were invited to join the Working Group in the light of their particular expertise. The work has required six virtual meetings and two in-person meetings held with the full Working Group in the period from July 2021 to September 2023. CIOMS warmly thanks the Institute of Health Law of the University of Neuchâtel, academic partner of the World Medical Association (WMA), who generously hosted the final meeting.

Each meeting had one or more rapporteurs, and we acknowledge their professional contributions. Furthermore we recognize the engagement of Johannes van Delden, Kim Ellefsen-Lavoie, Kotone Matsuyama and Henry Yau, who led the work of subgroups during the writing of their assigned chapters.

All Working Group members participated actively in the discussions, drafting, re-drafting and review of the texts that constitute the final consensus report. Comments received from external parties during the public consultation (see Annex 3) were highly appreciated and were addressed by the Working Group to develop the guidelines further. At the same time, we would like to thank Anahita de Lafond and Stanislas Boda from the University of Neuchâtel for gathering and processing all received comments beforehand.

We are especially grateful to Aline Sigrist and Annie Volet for the management and the coordination of the Working Group at all stages of the development of the guidelines.

At the CIOMS Secretariat, we warmly thank Sue le Roux for her contribution in organizing in person-meetings and providing administrative support throughout the project.

Finally, we wish to acknowledge Monika Zweygarth for her important role in supporting the editing process and finalizing the report for publication.

Lembit Rägo, MD, PhD
Secretary-General, CIOMS
Geneva, Switzerland, November 2023

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ABBREVIATIONS AND ACRONYMS

ALCOA+ principles	data should be **a**ttributable, **l**egible, **c**ontemporaneous, **o**riginal, **a**ccurate, **c**omplete, **c**onsistent, **e**nduring and **a**vailable
CIOMS	Council for International Organizations of Medical Sciences
COVID–19	coronavirus disease
CRIS	clinical research information system
DMP	data management plan
DTA	data transfer agreement
FAIR	findability, accessibility, interoperability and reusability
FCPA	the Foreign Corrupt Practices Act (United States)
GCP	good clinical practice
GGPRI	good governance practice for research institutions
ICH	International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH)
ICH GCP	ICH Guideline for Good Clinical Practice E6(R2)*
ICMJE	International Committee of Medical Journal Editors
ICTRP	International Clinical Trials Registry Platform
IPA	intellectual property agreement
IRB	institutional review board
IT	information technology
LIMS	laboratory information management system
MTA	material transfer agreement
NGO	non-governmental organization
PI	principal investigator
PPI	patient and public involvement
PPIE	patient and public involvement and engagement
REC	research ethics committee
SOP	standard operating procedure
UNESCO	United Nations Educational, Scientific and Cultural Organization
WAN	wide area network
WHO	World Health Organization
WMA	World Medical Association

* The next revision, ICH Harmonised Guideline on Good Clinical Practice (GCP), E6(R3), draft version endorsed on 19 May 2023, was under public consultation at the time of writing this document.

GLOSSARY

Conflict of interest
Situation in which a person or organization has two or more competing interests and there is a risk that a professional judgment concerning a primary interest could be unduly influenced by a secondary interest. The perception of a conflict of interest suffices to affect the trust of the parties in the impartiality of the judgement. Conflicts of interest are not necessarily of a financial nature. Behaviours and perceptions may also be influenced by non-material conflicts of interest (e.g. participation in research or publication projects, enhancement or loss of status, family or personal ties, etc.).[1]

Governance
The manner in which institutions exercise their power in the management of the organizational, human and infrastructure resources directly or indirectly dedicated to research activities. Governance includes mechanisms (structures, standards, procedures, strategies, processes etc.), both formal and informal, designed for the exercise of this power.[2]

Good governance
Principles guiding research institutions in the responsible and efficient exercise of their power in conducting research activities in a way that fulfils their obligations and goals, as described in this tool, toward all research stakeholders, in particular the human participants, the researchers and the population.

Good governance practice for research institutions (GGPRI)
A methodological tool describing good governance with the goal of helping research institutions to assess and improve the way they provide support to research stakeholders depending on their needs and according to their available resources. The purpose of GGPRI is that each research institution is aware both of the research activities carried out within its infrastructures— or in relation with them— and of its responsibilities on that behalf, and adopts the appropriate level of governance of research depending on its needs and resources.

Health-related research
Activities designed to develop, or contribute to, generalizable and transferable health knowledge within the more classic realm of research with humans. *Generalizable health knowledge* consists of theories, principles or relationships, or the accumulation of information on which they are based related to health, which can be corroborated by accepted scientific methods of observation and inference. *Transferable health knowledge* refers to the applicability of the research study's findings to other contexts, settings, circumstances and groups or patients. Health-related research encompasses a large range of quantitative and qualitative studies across disciplines

[1] Adapted from: Swiss Academy of Medical Sciences (SAMS). Guidelines. Collaboration between medical professionals and industry. Approved by the Senate of the SAMS on 2 June 2022. PDF

[2] Adapted from: World Bank. Governance and Development. Washington, D.C.: World Bank; 1992: p. 1. PDF

and methodologies including clinical trials, observational research, epidemiological studies, biobanking, natural history studies, behavioural research, and social science studies.[3]

Interventional research
Research involving an intervention on the participants, their behaviour or environment according to a research plan or protocol. These interventions may be with medical products, such as drugs or devices; procedures; or changes to participants' behaviour, such as diet or exercise. In biomedical research, interventional research is commonly known as clinical trial, which covers research on medicinal products, but also other types of interventions such as surgical procedures, use of medical devices, or cell and gene therapy.[4]

Observational research
Research based purely on what the researcher observes. There is no interference or manipulation of the research participants, their behaviour or their environment. Observational research seeks to systematically observe, record, and analyze a particular group of participants, society, culture, behaviours or attitudes. Participants may receive interventions (which can include medical products such as drugs or devices) or procedures as part of their routine medical care, but participants are not assigned to specific interventions by the investigator (as in a clinical trial).

In prospective observational research, researchers may collect health data or human biological samples which would not have been collected otherwise.[4] See also: "Re-use of health data and human biological material for research purposes".

Research institution
Any public or private entity or agency or healthcare or public health facility where health-related research is conducted. For the purpose of the present guidelines, the term "research institution' covers all facilities where—or in relation with which—health-related research activities are carried out, regardless of whether the research is explicitly recognized as part of the institution's mandate or core business, and is not limited to facilities primarily dedicated to health-related research (e.g. clinical trial centers).[5]

Research participant
Individual who participates in a health-related research project, either as the direct recipient of an intervention (e.g. study product or invasive procedure), or as a control, or through observation. The individual may be a healthy person who volunteers to participate in the research, or a person with a condition unrelated to the research carried out who volunteers to participate, or a person

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[3] Adapted from: Council for International Organizations of Medical Sciences (CIOMS). International ethical guidelines for health-related research involving humans. 2016. doi: 10.56759/rgxl7405

[4] Adapted from: National Institute of Health, U.S. National Library of Medicine. ClinicalTrials.gov: Learn About Clinical Studies. Webpage, accessed 23 October 2023.

[5] Adapted from: International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH) Guideline for Good Clinical Practice E6(R2). 2016. PDF. Note: The draft third revision of the ICH Harmonised Guideline on Good Clinical Practice (GCP), E6(R3), was under public consultation at the time of writing this document. The definition of 'trial participant' in the draft E6(R3) is the same as that of 'subject/trial subject' in E6(R2).

(usually a patient) whose condition is relevant to the use of the study product or questions being investigated.[6]

Research waste
Research that, for instance due to inappropriate design, conduct or dissemination of results, fails to advance scientific knowledge or provide a social return on the resources invested.

(See also "Resources")

Resources
In the context of this guideline, "resources" means time, training, qualified staff, facilities, clinical and laboratories equipment, hardware and software, communication tools, data protection infrastructure, health databases and biobanks, ethical and legal counselling, etc. This is not only a matter of financial support but also a question of governance, i.e. what services and support are made available to the researchers to meet their responsibilities as imposed by research ethics and regulation.

Re-use of health data and human biological material for research purposes
Use, in observational research, of existing health data or human biological samples already available that have been collected for a purpose other than research, e.g. for diagnostic, therapeutic or statistic purposes.

(See also "Observational research")

Scientific misconduct
Non-adherence to applicable procedures, policies and accepted ethical guideline principles laid out to safeguard scientific integrity, research participants' safety and/or public health, resulting from any kind of behaviour such as, but not limited to: fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. Fabrication is making up data or results and recording or reporting them. Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record. Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit. Scientific misconduct does not include differences of opinion.[7]

Study data
Health-related research data, internal clinical and/or research databanks and biobanks, as well as quantitative and qualitative data generated on patients, communities, care providers and from public health and healthcare settings.

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[6] Adapted from: World Health Organization (WHO). Product Research and Development Team. Operational guidelines for ethics committees that review biomedical research. Geneva, Switzerland: WHO; 2000. PDF

[7] Adapted from: European Federation of Academies of Sciences and Humanities (ALLEA). The European Code of Conduct for Research Integrity. 2023 Revised Edition. doi: 10.26356/ECOC

FOREWORD

Background

Scientific research is essential for the protection and improvement of the health and well-being of the populations around the world. Researchers are also at the front line of responding to major crises, such as the COVID-19 pandemic and climate change, that impact everyone. More than ever, the scientific community bears heavy responsibilities to face these unprecedented challenges. COVID-19 vaccines development is a unique example of the success of its concerted actions in the health sector.

Since the 1960s, research activities involving human participants have grown steadily with a trend toward globalization and industrialization. Health-related research has become highly complex with a wide range of stakeholders active at the local, regional and international levels. To facilitate and contain this process, numerous ethical, professional and industrial guiding documents have been adopted and constitute a dense normative framework. One of the first and most cited of these documents is the Declaration of Helsinki, adopted in 1964 by the World Medical Association, which is largely recognized as the "constitution' of research ethics, and which all other documents make reference to, including the 2016 CIOMS "International ethical guidelines for health-related research involving humans".

Key concepts

- **Responsibilities:** Most ethical guidelines and laws focus on individual researchers' responsibilities to protect the welfare, rights and dignity of research participants, with research ethics committees (REC) acting as gatekeepers. The International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH)'s 2016 Guideline for Good Clinical Practice E6(R2) (ICH GCP) is a notable exception as it provides detailed guidance on the responsibilities of the sponsors, covering governance, standard operating procedures (SOPs), quality assurance and data management issues. However, ICH GCP is designed for drug trials and does not address the role of other stakeholders, such as patient organizations and the community, or research institutions, even if it is often used as a reference in health-related studies other than drug trials. Another interesting document of reference is the World Health Organization (WHO)'s 2011 "Standards and operational guidance for ethics review of health-related research with human participants"; however, it mostly focuses on the responsibilities of entities establishing RECs. It has been complemented by the 2023 "WHO tool for benchmarking ethics oversight of health-related research involving human participants", which includes a chapter on research institutions.

  In practice, it is rarely assessed to what extent researchers have the necessary resources in their institution to fulfil their responsibilities. This assessment is done separately for each protocol in the absence of an agreed reference framework, with the consequence that there is

often little information on the research activities and the resources available in each organization, hospital or healthcare facility to guarantee the protection of research participants and of their communities, and the quality of research.

- **Governance:** In 2016, the World Medical Association included a section on governance in its "WMA Declaration of Taipei on ethical considerations regarding health databases and biobanks". The 2016 CIOMS "International ethical guidelines for health-related research involving humans" also addresses the issue of governance for biobanks, which is likewise included in the Council of Europe's 2016 "Recommendation CM/Rec(2016)6 of the Committee of Ministers to member States on research on biological materials of human origin". This illustrates a growing attention, in research ethics, to the resources needed to conduct research and on the governance of these resources.
- **Patient involvement:** In 2022 the CIOMS Working Group XI report on "Patient involvement in the development, regulation and safe use of medicines" stressed that ethical medical and biological research regards those likely to use medicines as expert partners who can meaningfully contribute their preferences, concerns, understandings, and lived experiences of a medical condition to improve medicine development and use.
- **Intersectionality:** Another key issue is the recognition of the diversity of communities with their specific needs and social positions, which must be addressed in a more comprehensive way in health-related research. From this perspective it is essential to acknowledge the intersectionality of potential disadvantage based in particular on sex, race, ethnicity, gender (including gender identity), disability, migrant status, education or class. In other words, "all forms of inequality are mutually reinforcing and must therefore be analysed and addressed simultaneously to prevent one form of inequality from reinforcing another'.[8]
- **Equitable partnerships:** Addressing the challenge of promoting health equity in research ethics, and in line with the conceptual work on vulnerability in the 2016 CIOMS ethical guidelines, other important documents of reference have been adopted recently focusing on the equitable use of existing resources, while promoting collaboration and participation of all stakeholders: the 2016 "FAIR Guiding Principles for scientific data management and stewardship", the 2018 "TRUST Code – A Global Code of Conduct for Equitable Research Partnerships" and the 2021 CIOMS consensus report on "Clinical research in resource-limited settings". Moving away from the paternalistic view that research participants are primarily defined by their vulnerability and their need to be protected, these documents are based on a more egalitarian perspective that research participants and their communities should also be considered as—and treated like—co-creators of the research they are involved in. This calls for a change in the way their participation is organized, for their opinion to be heard from the conception of research projects throughout their conduct and subsequent dissemination of results, a principle that has become known as "patient and public involvement and engagement" (PPIE).

[8] https://www.intersectionaljustice.org/what-is-intersectionality

These paradigm shifts create an urgent need to better recognize the essential role of institutions in which—or in relation with which—research is conducted. The guidelines presented here are meant to fill a gap in the normative framework of health-related research involving human participants by helping research institutions to offer a proper environment for the researchers to meet their ethical and professional responsibilities. These responsibilities might differ and present specificities between various disciplines (for example, between biomedical sciences and social sciences). They are grounded in the vision that institutions should not ignore or cover up unethical research activities but should rather stand for the principles of research ethics as part of their social contract and implement the highest ethical, legal, professional and scientific standards in the field of health-related research.

Aim of the *International guidelines on good governance practice for research institutions*

The aim of the present guidelines is to help research institutions better fulfil their responsibilities in terms of protecting human research participants and their communities, involving and engaging them in the research processes, and guaranteeing the pertinence and quality of research while making best use of available resources. The guidelines review the existing international standards and best practices in the field of health-related research and offer research institutions detailed and specific guidance on how to implement them. The present guidelines are complementary to the provisions on governance that have been introduced in the recent documents of reference listed at the end of this foreword, including the ICH GCP.

The role of institutions

Institutions contribute to health-related research for instance through the participation of their patients and users, and/or their personnel, in research, surveys, questionnaires or interviews on health-related issues, helping to develop or contribute to generalizable or transferable health knowledge. They also contribute by authorizing the sharing of health data and biological material with researchers within or outside the institution. Concerning the further use of health data and biological material for research purposes, it can be done in any healthcare or public health facility collecting such data and material. In fact, many studies are not carried out in dedicated research centers but in public or private healthcare centers, hospitals, day care or home care facilities or in public health services.

Carrying out research in—or in relation with—an institution involves some degree of responsibilities for that institution even when an external sponsor is driving the study. Public or private entities or institutions are legally and ethically responsible and accountable for the health-related research they conduct or sponsor, for fulfilling their obligations and responsibilities not only towards their own mission, but also for the human participants, researchers, population at large and other research stakeholders. This includes protecting the welfare, rights and dignity of the participants, as well as the staff's and independent researchers' rights, scientific freedom and integrity, in a sustained way. Appropriate measures to respect the environment should also be in place. The institutions' responsibilities are derived from their general obligation toward their patients and the populations they care for, but also linked to the fact that institutions may be employers or potential sponsors of researchers as they are supporting and financing them,

knowingly or not. Research institutions are bound to respect these responsibilities in any case, whether they identify themselves as such or not.

Even when research activities remain at a low level, they raise issues in terms of research ethics, public health and scientific integrity deserving careful consideration from research institutions. This is not only in their direct interests, but is essential to maintain the trust of patients and the public in research and science. Yet, while scientific freedom must be respected and the creativity of the researchers should be encouraged, it is neither necessary nor desirable to create clinical research centers in most institutions. Not all research involving human participants requires the same level of scrutiny and ethical evaluation. The guidelines presented in this report aim to provide research institutions with a tool to better benefit from research activities while limiting the diversion of resources needed for healthcare and public health interventions. What is essential is that each research institution is aware of the activities carried out within—or in relation with—its infrastructures and adopts the appropriate level of governance depending on its needs and resources.

The CIOMS Working Group

The Council for International Organizations of Medical Sciences (CIOMS) is an international, non-governmental, non-profit organization established jointly by WHO and UNESCO in 1949. CIOMS mission is to advance public health through guidance on health research including ethics, medical product development and safety.

CIOMS reports are in-depth guidance documents which serve as worldwide references and guidance for specific subject matters. In addition to the revised 2016 CIOMS "International ethical guidelines for health-related research involving humans", CIOMS Working Groups published in 2021 a consensus report on "Clinical research in resource-limited settings" and in 2022 a report on "Patient involvement in the development, regulation and safe use of medicines".

As a unique global and scientific organization, CIOMS is well positioned to develop a multi-stakeholder international guidelines document on good governance practice for research institutions (GGPRI). A Working Group was mandated by CIOMS Executive Committee to address the issue, building on existing ethical and professional guiding documents as well as current regulations at the national, regional and international levels. The main task is to target institutions which do not consider research as part of their primary mission, in order to improve their capacities in the field by offering an appropriate environment for their researchers to conduct their activities according to high standards in research ethics and regulation.

The starting point of the CIOMS Working Group on GGPRI has been to identify the various resources needed to realize health-related research projects, regardless in which category. "Resources" here means time, training, qualified staff, facilities, clinical and laboratories equipment, hardware and software, communication tools, data protection infrastructure, health databases and biobanks, ethical and legal counselling, etc. It is not only a matter of financial support but more of a governance question, in other words, what services and support are necessary for researchers to meet their responsibilities as imposed by research ethics and regulation.

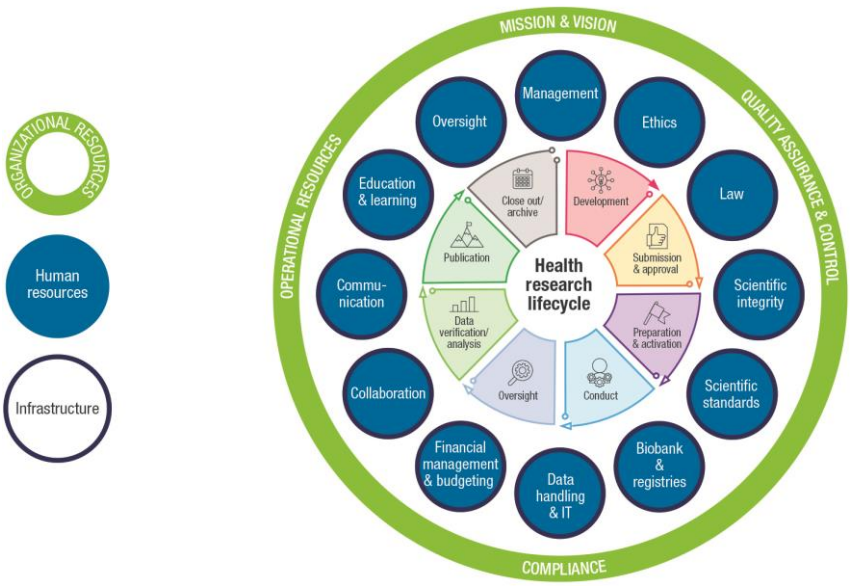
Structure and content of this report

To facilitate their understanding and use, these guidelines have been divided into twelve domains to which institutions should pay attention, namely:

1. management;
2. ethics;
3. law;
4. research integrity & conflict of interests;
5. scientific standards;
6. collection, storage and use of data and biological materials: biobanks & registries;
7. data handling & information technology (IT);
8. financial management & budgeting;
9. collaboration;
10. communication;
11. education & training; and
12. institutional research oversight

Each domain encompasses various resources that can be subdivided in terms of infrastructures, human resources and organizational resources (Figure 1). These resources should be available in all research institutions, especially the infrastructure and human resources being used for research, although they may not necessarily be under the explicit control and supervision of the institutions themselves. Improving the governance of research in each domain is an efficient way of making better use of those resources. Each domain is equally important but may be more or less predominant in specific research projects, depending on the circumstances.

FIGURE 1. Main domains to consider in the good governance practice of research institutions



In general, there is one chapter per domain, but some domains have been treated in a single chapter as they are linked so closely in practice that researchers are used to dealing with them together. Each chapter should be interpreted and read in light of the others, and not in isolation.

Each chapter sets out the background and the applicable principles, as well as the main points to consider in the given domain and how to address them. Relevant key concepts are listed and/or highlighted in **bold**. A list of references concludes each chapter (with hyperlinks in the online version of this document),[9] creating the link with the existing normative framework of research involving human participants. The points to consider are also listed in annex as a tool for the research institutions to map research activities and available resources, but also to follow up the progress being made to reinforce good governance practice in the institutions. To facilitate reading and referencing, the numbering of the key points used in the chapters corresponds to that in the annex.

Research involving human beings is usually a highly complex activity involving several constraints, and is conducted within a detailed regulatory framework. This explains why some chapters are more detailed and technical than others, reflecting the domain being addressed. The technicality of fields such as IT or biobanking cannot be ignored. This is especially true in the field of drug trials, which are often considered as the gold standard in biomedical research with human participants, and for which the ICH good clinical practice guidelines (ICH GCP) were mainly designed. Although their importance in research practice cannot be contested, it is also true that ICH GCP is less well adapted for application in research fields such as behavioural research, observational studies or qualitative studies. In some instances, their implementation could even be detrimental to both the protection of research participants and the quality of research.

Implementation

These guidelines can be used as an introduction to health-related research from the view point of institutions. They can be read as an introduction to existing international guidelines, professional standards and best practices in the various domains covered in each chapter, or as a complement to them.

When implementing these guidelines, research institutions should:

1. identify the current and planned research activities being conducted within the institution— or in relation with it —and evaluate the main issues at stake;
2. map the existing resources used for research in each domain (see Figure 1), and how they support the primary mission of the institution; and
3. design a strategy to improve coordination of research activities for the benefit of the institution's overall activities. In most instances, a research strategy should not be defined in isolation but in relation with broader strategies related to improving the efficiency of the institution, quality assurance and quality control as well as patient safety and patient involvement.

[9] Freely available at https://doi.org/10.56759/hslk3269

According to the available resources, institutions should set their own priorities in taking these steps, depending on their specific needs in each domain. This can be done in a participatory process with all the professionals in the institutions, the patients and the population. There is a direct link between research, quality of care and the capacity of institutions to respond to the health needs of the population. Making due allowance for research activities in the management of an institution's resources will therefore benefit all the other activities of the institution concerned.

In many institutions in which— or in relation with which— research is conducted, there is limited attention paid to research by the management. One common reason is that research is not part of the institution's mission. Yet, for physicians and healthcare professionals, research is essential to address the needs of their patients and is, therefore, an ethical and professional obligation. For physicians and other healthcare providers it can also have an important impact on their careers and academic recognition. These guidelines can thus also be used by researchers themselves to engage in a dialog with their institutions on issues of governance, quality assurance and control, patient safety or patient involvement. Lastly, commercial sponsors and funding agencies could also consider referring to them when implementing their research projects at the institutional level.

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Links to all the references listed in this document are found in the online version, which is freely available at https://doi.org/10.56759/hslk3269.

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CHAPTER 1.

RESEARCH INSTITUTION MANAGEMENT

Background and principles

Research institutions, like any other enterprises and organizations, exist for a specific social purpose which can only be achieved by good governance through formulation and implementation of suitable management strategies. The three **dimensions of management** for any organization are:

- defining the specific purpose and mission of the organization;
- making work productive and the workers achieving; and
- managing social impacts and social responsibilities.

Governance for research institutions requires continuous attention, evaluation and enforcement of ethical, legal and scientific standards, financial management policies, collaboration and communication strategies, staff education and learning, and institutional research oversight. Good governance comprises ethics, integrity, compliance, transparency and public accountability and should be built on four **core management elements**:

- defined research scope, mission, vision and values;
- effective organizational structure, leadership and culture;
- robust knowledge management, quality management and risk management; and
- open and effective communication with stakeholders.

Points to consider and how to address them

1 — Research scope, mission, vision and values

Institutions that conduct research are of a wide diversity in their business scopes (see also the glossary definition of "Research institution"). While some may be academic institutions engaging in a full spectrum of research areas ranging from interventional clinical trials on novel medicinal products to non-interventional health-related studies (e.g. university hospitals, clinical trial centers), others may have their main business in areas other than research (e.g. hospitals and healthcare facilities providing clinical services), and some may also allocate part of their time and

resources to support health-related research projects with particular interest (e.g. patient-oriented outcomes research, paediatric research). Each research institution should therefore, considering its core business, direction and corporate social responsibility, define its research mission, vision and values in alignment with its scope of research. Clear research scope, mission, vision and values are of paramount importance to a research institution as they set the ground for:

- formulating its organizational structure, personnel composition, resource plans and development strategies, including research priorities;
- designing its facilities and infrastructures, operational workflow and technology applications; and
- attracting qualified professionals and guiding their professional conduct and behaviours.

2 — Organizational structure, leadership and culture

Health-related research is knowledge-based, multidisciplinary, dynamic, and forward-looking whilst practical. To respond to its needs in research based on its available resources, a research institution should build an organizational and human infrastructure with:

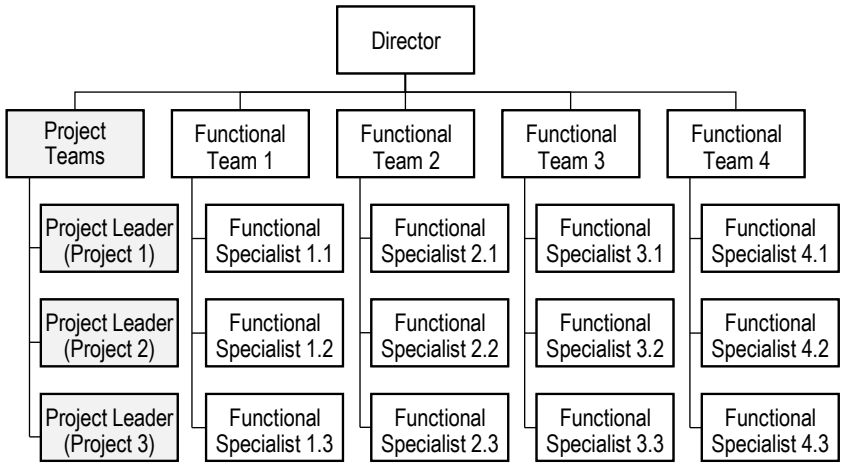
- leaders interested in research and empowered to undertake ethical leadership in driving the management and development of the research institution;
- a suitable mix of diversified professionals that together cover the institution's scope of research, with well-defined roles and relationships which facilitate effective teamwork among the members and support efficient delivery of research outputs; and
- an ethical culture that facilitates the productive execution of the institution's research activities—both at organizational and individual levels—and supports the accomplishment of the institution's social responsibilities and social impacts.

An understanding of health-related research adds value to research institution leadership. However, the motivation and vision for accomplishing an institution's mission and social responsibility through research may be even more important for effective leadership. A research institution leader should therefore be motivated to appreciate research ethics and compliance standards, and should possess professional management skills, in particular in attracting, retaining and growing suitable professionals, facilitating teamwork and resolving conflicts and dilemmas. On the other hand, with due respect to the importance of science, leaders of research institutions do not necessarily need to be top scientists.

Effective teamwork starts from a clear description of job roles, with defined lines of reporting, collaboration and allocation of responsibilities, which should be illustrated on a clear organizational chart and outlined on the corresponding written job descriptions. Modern organizations in dynamic industries, such as dedicated research institutions, may consider adopting a **matrix management** approach (Figure 2) where a functional specialist may report to a functional team leader and to several project team leaders at the same time in order to enhance the open and efficient cross-functional communication that is necessary for multidisciplinary collaboration.

Institutions not having research as part of their core business may adopt other management structures that can support the scopes and volume of their research activities, provided that their project and functional expertise can be synergized to uphold the institution's mission and vision.

FIGURE 2. Example of matrix management



Organizational culture refers to a set of shared assumptions and norms that guide the behaviour of an organization's members. An ethical culture in the workplace is the basis of effective management and teamwork for sustainable organization. Research institutions should therefore strive to build an ethical culture by securing the core ethical principles at work through developing and enforcing relevant codes of conduct on:

- social value and social accountability;
- ethical, legal and quality compliance;
- transparency, integrity and whistleblowing;
- the well-being of collaborators and research participants at any level;
- maintaining an inclusive and unbiased approach to staffing, nurturing a suitable organizational culture and providing necessary support for equal opportunities (including but not limited to cultural diversity and pluralism, non-discrimination of minorities and vulnerable groups, and intolerance of sexual or other types of harassment);
- promoting, and supporting the principle of gender inclusivity and equity throughout the research cycle;
- respect, open mindedness, open communication and collaboration;
- continuous learning; and
- occupational health and safety.

3 — Knowledge management, quality management and risk management

A research institution can only achieve its objectives through continuous accumulation of knowledge and experience, which may take time. This means that a research institution should facilitate not only contemporaneous collaboration among staff members working together at the same time, but also cross-generational collaboration among members who worked for the

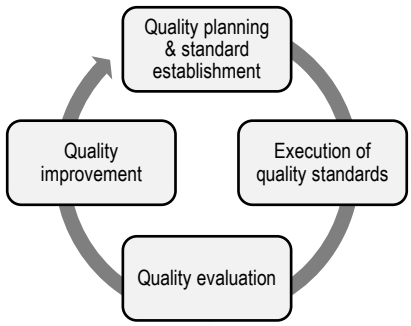
institution at different times. Robust knowledge management, quality management and risk management are therefore key for sustainable research institutions.

Knowledge management is the process used to collect, organize and retain information and knowledge in a retrievable and usable manner. Good knowledge management supports the efficient and effective acquisition, accumulation, organization, processing, utilization and sharing of professional knowledge and experience—among staff members and over time—and facilitates innovation and development of a research institution as a "learning organization" able to evolve continuously to meet its changing research needs and operate with long-term sustainability. Knowledge management may be powered by an adaptive information technology system, but should more importantly be built on a learning culture signified by proactive learning, open exchange and sharing among personnel at all levels (including mentorship of less experienced staff), as well as continuous improvement with the support of a robust quality management system.

Quality is a cornerstone of health-related research. A **quality management system** is a continuous cycle (Figure 3) consisting of the following four components.

- **Quality planning and standard establishment:** identifying or defining applicable quality standards and establishing suitable policies and standards operating procedures (SOPs) (e.g. establishing institutional policies mandating research ethics and scientific oversight by a research ethics committee appointed by the research institution)
- **Execution of quality standards:** training of staff and continuing monitoring of performance (e.g. providing training on updated concepts and requirements on health-related research)
- **Quality evaluation:** regular and systematic evaluation of performance (e.g. establishing a quality control mechanism and performing quality control regularly and as needed)
- **Quality improvement:** undertaking corrective actions and preventive actions in response to any quality issues identified, including escalation to senior management and research ethics committee, and adjusting quality standards and quality plans to support continuous improvement (e.g. classifying quality issues based on the nature and level of impact and prescribing appropriate corrective and preventive actions)

FIGURE 3. The quality management cycle



Risk management: Any research institution aiming at continuing involvement in health-related research should establish an operable quality management system meeting its research needs. Robust quality management also helps an institution to manage its risks and attain long-term sustainability.

Research is a process of discovering and developing new knowledge. This unavoidably involves uncertainty and hence some risks. Health-related research relies on the willingness of research participants and the public, involves utilization of scarce (public and private) research resources, and is subject to stringent compliance requirements. Any research institution should therefore consider at least three main areas of risk including:

- participant risk: risk on protecting the rights, safety and well-being of research participants and the related communities;
- compliance risk: risk on ethical, legal and quality compliance; and
- resource risk: risk on appropriate acquisition and utilization of research resources.

Research institutions should not be afraid of risks, provided that those risks are well known and are under control. While risks may not be fully eliminated, they can be effectively managed by applying the "6As" risk management strategy as outlined in Table 1 below.

TABLE 1. "6As" risk management strategy for research institutions

Risk management strategy		Examples of risk management measures
Alert	Identify risks and communicating with the relevant stakeholders	▪ Identifying risks through scientific and ethical review ▪ Communicating risks with research participants via informed consent
Abate	Minimize the likelihood (probability) of risk occurrence	▪ Implementing public involvement in research design and arrangements ▪ Enhancing research competence of research personnel via training and learning ▪ Implementing a robust quality management system
Alleviate	Minimize the consequence (harm) of risk occurrence	▪ Implementing continuing oversight of research activities to facilitate early detection of risk occurrence (e.g. establishing safety monitoring committees for research projects of higher safety risk) ▪ Implementing a complaint management mechanism and a contingency management mechanism to facilitate prompt handling of risk occurrence
Assign	Transfer risks to third parties	▪ Transferring risks by insurance/indemnity to insurers/indemnifiers ▪ Allocating risks appropriately by written contracts among collaborating parties
Accept	Accept identified and controlled risks	▪ Allocating sufficient financial and other resources and implementing an appropriate risk management mechanism
Abandon	Give up research activities with unacceptable risks	▪ Giving up entire research projects, or parts of projects ▪ Making substantial modifications to research projects to bring their risk to an acceptable level

4 — Communication with stakeholders

Health-related research is people-oriented, since it is performed by people (e.g. researchers, research institution personnel and sponsors), with people (i.e. research participants) and for people (i.e. patients and the public). Research institutions are therefore accountable to their stakeholders, including the public, and have the responsibility to properly communicate their research activities, results and outputs to them in a timely manner. Key stakeholders of a research institution include (but are not limited to):

- research participants;
- patient groups;
- the general public and media;
- research ethics committees and regulatory agencies;
- professional scientific associations/organizations/networks;
- research project sponsors;
- funding bodies; and
- researchers, research personnel and supporting staff.

Communication is not only about disclosure of research results. It should be taken as a part of a research institution's organizational strategy and should bring important value including:

- **social responsibility and social impacts:** fulfilling an institution's social responsibility of research transparency and accountability and communicating the social impacts;
- **public awareness and trust:** increasing public awareness and trust, and their support for health-related research;
- **patient/public focus:** aligning research focuses and priorities with the needs of patients/public and improving research design through patient/public participation;
- **research participants involvement:** involving the participants in research projects and activities;
- **scientific exchange:** accelerating research by sharing of research methods and results via publication and public disclosure;
- **research collaboration:** encouraging research collaboration among research institutions;
- **funding:** attracting research funding and resources;
- **staff commitment:** promoting staff's commitment to the institution's mission, vision and values and improving the institution's performance, sustainability and long-term success.

Detailed recommendations are provided in Chapter 7. Communications.

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CHAPTER 2.

ETHICS, LAW AND SCIENTIFIC INTEGRITY

Introduction

Health-related research raises a wide range of ethical and legal challenges. In this chapter we will describe the responsibility of institutions to create an environment where people adhere to the principles described below. If national laws use a description of biomedical research that narrows research to drug clinical trials, we urge the institutions performing research to follow the broader definition of health-related research used in this guideline, in the 2013 Declaration of Helsinki, the 2016 Declaration of Taipei and the 2016 CIOMS international ethical guidelines (and see the definition of "Health-related research" in the Glossary).

First, there are issues related to the **protection of research participants**: respect for autonomy of participants and for their dignity, fair inclusion of populations, protection of vulnerable populations, respect of privacy and confidentiality, informed consent, favourable balance between the risks and the benefits, choice of comparators, compensation in case of research related damages, etc.

Second, the **rights of the researchers and scientific freedom must be respected**. This includes having access to the necessary resources including sufficient working hours, having limited barriers to publish and share research data and results, being protected from negative external pressures (financial, professional and academic), etc.

Third, the **scientific integrity of research activities must be guaranteed**. This not only requires managing conflicts of interest and preventing and addressing the occurrence of scientific misconduct but it also creates a culture in which more emphasis on the social value of research can flourish.

Fourth, regardless of their statutes and whether research is part of their mandate or core business, **research institutions are accountable to research participants and populations**, whose trust is indispensable and essential to ensure participation in—and support for—research. This implies working in transparency, co-creation in research, communicating about research activities and outcomes, and thus earning the trust and social license to operate from patients, communities and the public in order to be able to continue scientific research.

In many research institutions, the task to cope with all those complex ethical and legal issues lies on the shoulders of the individual researchers. Yet, the research institutions have their own

responsibilities—first towards research participants who also are patients or key stakeholders in those institutions, and second, towards the researchers themselves as their employees or service providers/consultants. At least, their responsibilities should be carefully assessed to manage liability risks if something goes wrong in a research project.

Points to consider and how to address them

5 — Responsibilities towards research participants

Research institutions are responsible to ensure that research participants' rights are respected, because these institutions function either as employers of the researchers or as research sponsors when there is no external sponsor (funding agencies, foundations, industry). In most countries, institutions are not allowed to waive their responsibilities. This means they should implement oversight mechanisms over research activities conducted by their employees or within their infrastructure, or in relation with them, ensuring that researchers act according to the applicable ethical, legal, professional and scientific standards and that the welfare, rights and dignity of the participants are guaranteed. The level of scrutiny depends on the nature and the intensity of research activities and the level of risks for the participants, the community and society at large. The more intense the research activities are and the higher the risks are for the participants, the higher is the interest in research institutions to set up the necessary mechanisms to fulfil their obligations to limit the risks and manage the consequences or any research-induced damages (see Chapter 9. Institutional research oversight).

Research institutions should give special attention to the following.

- Ensuring that employees, collaborators and partners involved in research as investigators or member of research teams have the required education, training and expertise according to the applicable standards and laws.
- Ensuring that researchers and research team members are gender-balanced and belong to diverse ethnic groups that are representative of the populations the research institution usually studies.
- Creating conditions for meaningful engagement and participation in the full cycle of a research project, as well as capacity building and contributions towards research outputs. Research participants, patients and local communities should be included throughout the research process from planning through post-study feedback and evaluation.
- Ensuring that research projects are submitted to the competent research ethics committee (REC) and competent authorities for review and that no project starts without prior approval/positive opinion of the competent REC and competent authorities when required by law. For that purpose, establishing a registry of research proposals with their status (submitted, approved, on-going, ended) and tracking this at a central level is important.
- When there is more than one REC operating within the research institution or in relation with it, providing clear guidance to researchers to which REC they must submit any given project and preventing any form of "forum shopping".

- When by law a project should not only be reviewed by the competent and relevant REC, but also by other committees such as a biosafety board or resource management committee, ensuring that researchers are informed about their obligation and providing them with clear guidance on the procedure to follow.
- Ensuring that all required contracts and agreements—e.g. material transfer agreements (MTA), data sharing agreements (DTA) or intellectual property agreements (IPA)—are adequate and signed to protect the participants as well as the interests of the researchers and the institution.
- Ensuring that any documents including contracts:
  - are compliant with the information and consent form;
  - provide for care for participants' health needs while participating in research in accordance with applicable law (see the 2016 CIOMS international ethical guidelines, Guideline 6);
  - provide for participants' access to medical care and compensation in case of damages suffered while participating to research, in accordance with applicable law; and
  - do not limit the communication of any new information of interest to participants.
- Ensuring that research participants, including healthy volunteers, who may be in a situation of vulnerability, e.g. because of their financial situation, educational level, age, etc. are in a situation of providing free, informed consent without undue inducement or pressure.
- Following up in case of complaints about research misconduct.
- Ensuring that personal data and biological material are handled according to the applicable principles, including privacy, confidentiality, and global justice. Making sure that the institution provides substantial support to the researchers to assess the required level of data safety as well as ethical and legal counsel to meet these requirements (see Chapter 4. Collection, storage, and use of data and/or biological materials in health-related research).

6 — Responsibilities towards researchers and research team members

The first responsibility of institutions towards researchers and research team members is to provide them the necessary support so they can fulfil their responsibilities towards research participants and conduct good quality research. Therefore, all measures aiming at respecting the rights of research participants should be considered as protecting and supporting the researchers and the research team members as well. However, researchers also need specific support to protect their interests in terms of scientific freedom and integrity. These responsibilities are also reflected in the 2017 UNESCO "Recommendation on science and scientific researchers".

Research institutions should give special attention to:

- Defending scientific freedom in the negotiation and conclusion of research agreements and all other contracts related to research activities. This includes warranting that researchers, while respecting participants' rights, keep control over the design of their projects, over the collected data and biological material, over the research analysis and the publication. Any limitation to the right to publish results, either positive or negative depending on the research primary and secondary outcomes, should be carefully assessed to guarantee that it is limited in time and that all results can be published within a reasonable time.

- Providing resources to researchers for ethical or legal issues that they may encounter in the drafting, evaluation and conduct of research, and the analysis and publication of results. This could take the form of offering funding to seek legal counselling on specific issues, such as liability, or assisting with the conclusion of the various agreements related to the conduct of research projects, for instance by making agreement templates available.
- In research partnerships where researchers are operating in resource-limited settings, additional care should be taken to guarantee that the local researchers benefit from the same freedom and protection as their colleagues from high-income settings, for instance by securing their rights in research agreements and research funding agreements.
- Institutions are encouraged to provide research management, financial risk management and forecasting as well as administrative and legal support.
- Assessing research agreements. This at least implies:
  - advising researchers on their capacity to sign or not to sign an agreement on behalf of the institution;
  - assessing whether those contracts respect the applicable laws in terms of protecting the participants and the interests of the researchers and the institution; and
  - developing templates for agreements (or using existing ones at the local, professional or national levels) and signing umbrella agreements with partner institutions and stakeholders with whom there are regular collaborations in terms of research activities and exchanges of personal data and biological material.

7 — Institutional culture to enhance working with scientific integrity

In many scientific environments there still is a culture which can be described as "publish or perish". That culture has put scientific integrity under stress and has led the scientific community to produce significant research waste,[10] which has produced results that are hard to replicate and bring hardly any social value (see Chapter 3. Scientific standards). In such a culture of "publish or perish" the likelihood of scientific misconduct increases, with detrimental consequences.

The countermovement is apparent under different headings (e.g. "Open Science", "Responsible Research and Involvement", "Science in transition") and puts much more emphasis on the quality, usability and social value of research and less emphasis on H-index and on citation indexes of journals. It should be noted that Open Science does not only mean publishing in open access journals, but also denotes active engagement of all stakeholders ("Open to Society") during all research phases. [11]

Another aspect of scientific culture centers around hierarchy, between individuals in different positions (patients, researchers) but also between disciplines. Although clear communication

[10] See the Series 'Research: increasing value, reducing waste' of five papers published in *The Lancet* in 2014. https://www.thelancet.com/series/research.

[11] The 'Joint Appeal for Open Science' was first published in October 2020 by WHO, UNESCO and the UN Human Rights Officer of the High Commission. See https://www.unesco.org/en/articles/joint-appeal-open-science.

lines are beneficial for an efficient conduct of a research project (see Chapter 1. Research institution management), it must be underlined that an overly strict hierarchy may contribute to an atmosphere in which conflicts of interest could flourish and scientific misconduct could occur. It is essential for researchers to operate from a stance that the other person could be right; to allow counterarguments; to acknowledge that reigning paradigms may be wrong and that new creative ideas help to bring a field forward. Hence it is important to create a safe atmosphere in institutions that perform research in which scientific creativity can flourish. This creativity should also be promoted by a fair balance of collaboration and independence between individuals as well as scientific disciplines.

Scientific knowledge is a source of hope and of dispute in times of uncertainties. It requires trust from the public but also within the scientific community at the local, national and international levels. Research institutions should maintain and foster that trust, as they are directly affected when it is questioned or lost, and also because such occurrences impact trust in the larger scientific enterprise. A breach of scientific integrity, either by a researcher or by the research institution, can affect the participants' welfare, rights and dignity but also the capacity of research institutions to fulfil their mission beyond the research field. It is therefore important that researchers adhere to publication ethics, which for instance entails complying with authorship criteria, and acknowledging the importance to publish all research including that with negative findings, in order to avoid research waste. This is also reflected in Guideline 36 of the 2013 Declaration of Helsinki and in Guideline 24 of the 2016 CIOMS Ethics Guidelines. In order to manage conflicts of interest, according to the 2016 CIOMS international ethical guidelines (Guideline 25), research institutions, researchers and research ethics committees should take the following steps.

- Research institutions should develop and implement policies and procedures to mitigate conflicts of interest and educate their staff about such conflicts.
- Researchers should ensure that the materials submitted to a research ethics committee include a disclosure of interests that may affect the research.
- Research ethics committees should evaluate each study in light of any disclosed interests and ensure that appropriate means of mitigation are taken in case of a conflict of interest.
- Research ethics committees should require their members to disclose their own interests to the committee and take appropriate means of mitigation in case of a conflict of interest.

Research institutions should give special attention to:

- setting up internal procedures or guidelines addressing research integrity, including conflicts of interests and scientific misconduct (e.g. fabrication, falsification, plagiarism, deception) and supporting and protecting whistleblowers with robust whistleblower management systems;
- ensuring access to training on those issues at all levels, starting with undergraduate education institutions and including all personnel potentially involved in research activities (see also the UNESCO "Recommendation on science and scientific researchers", 2017) including research ethics committee members;
- adhering to anti-bribery laws; and

- offering researchers the necessary legal support, especially for research with external partners.

8 — Accountability, transparency and participation

Research institutions rely on potential participants and the population to conduct research activities. This requires a high level of trust that can only be gained by acting in an accountable and transparent way including some level of participation of all stakeholders, especially the research participants, patients, and the population.

Research institutions should give special attention to:

- ensuring that research activities are included in the annual report and subject to question by the competent organs/units/committees of the institution and the general public;
- reporting to clinical trial registries or similar research registries (where applicable) and/or making information available on the website of the institution (where available), so that information about research can become available also in the WHO International Clinical Trials Registry Platform (ICTRP);[12]
- defining procedures that allow patients, research participants and the general public to be involved in defining research priorities and in the drafting of research strategies or research projects; and
- including patients, participants or their representatives in the organs/units/committees of the institution, if possible, with decision power.

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National law, covering in particular:

- Anti-bribery law
- Biobanking law
- Biological safety, fight against epidemics
- Contract law
- Data protection law
- Education and research law
- Human research law
- Human rights
- Intellectual property law (authorship, patent …)
- Labour law (protection of the researchers as workers/employees)
- Liability law
- Patients' rights
- Public health law
- Scientific integrity (conflict of interest, scientific misconduct …)
- Therapeutic products law (medicinal products, medical devices, human cells, tissues and organs, etc.)

CHAPTER 3.

SCIENTIFIC STANDARDS

Background and principles

The primary goals of health-related research are to understand human health and well-being, the causes, development and effects of diseases, and to identify or improve preventive, diagnostic and therapeutic interventions to maintain or restore health and improve quality of life. There are many useful **approaches to health-related research**, including clinical trials, observational studies, natural history studies, epidemiological studies, social science studies, and research using existing human biological material and data. Not necessarily depending on the approach, research involving human participants can be based on quantitative methods, qualitative ones or a mix of both. For all approaches, and regardless of the envisioned risks to the research participants, **scientific rationale and methodological rigour** are considered sine qua non ethical and scientific requirements. Attention to scientific quality, rigour and feasibility in the research objectives, design and methods is essential in order to assure the usefulness and quality of the data, avoid waste, and justify asking humans to participate while protecting their rights, safety, and well-being.

It is increasingly recognized that research produces "blind knowledge" if it does not include sex and gender differences in the design, does not account specifically for sex and/or gender effects in analyses, or does not report sex or gender of participants in the results. This reduces reproducibility, results in a waste of resources, leads to missed opportunities for innovation, causes harm, and contributes to health inequity. It is the responsibility of research institutions to ensure that researchers **consider and account for sex and gender** throughout the entire research process, including the conceptualization and design of research and the publication of results. Sex refers here to the different biological and physiological characteristics of males and females, such as reproductive organs, chromosomes, hormones, etc.; while gender refers to the socially constructed roles, behaviours, expressions and identities of women, men and gender diverse people that influence health-related behaviours, risk exposure or access to healthcare. Accounting for sex and gender is not solely a matter of including men and women in trials, but rather it necessitates the collection and reporting of data that is disaggregated by sex, as well as meaningful sex- and gender-based analyses that include study-specific intersectional factors such as class, age and race. In fact, a growing number of medical journals and funding agencies are requesting today a gender-sensitive approach and/or gender equality plan.

In order to **avoid research waste** as much as possible, it is important to improve health-related research workflows. The term "research waste" can been defined as inappropriate research design or conduct or inappropriate research results analysis, interpretation or dissemination leading to research outcomes that cannot be used or with no societal benefits. In each case, they fail to advance scientific understanding or provide a social return on the resources invested. That waste could be potentially avoided if the development of health-related research was preceded by a systematic assessment of the existing evidence. In addition, the institution should encourage their researchers to perform health-related research focused more on producing replicable results with social value instead of their own visibility through an H-index or citation index.

Much of the responsibility for scientific quality and integrity lies with the researchers. Yet, **institutions that host research are responsible** for making sure their researchers and research teams have the appropriate guidance, training and support to conduct quality research and that there is sufficient review and oversight of the science and the research plans. To fulfil these obligations, institutions should ensure the quality, integrity and rigour of the science and the scientific standards employed in their research. Research that is not scientifically sound and that cannot achieve its stated objectives is not considered ethical.

Points to consider and how to address them

9 — Awareness and coordination of proposed and ongoing research

Quality research requires knowledge and skills, planning, coordination, caring and resources. Institutional attention to the significance of the research, the details of research design and conduct, and the feasibility of successfully completing the research are essential to protect participants and to generate useful and reliable knowledge, as well as for compliance with regulations and efficient use of institutional and research resources.

Research institutions should give special attention to the following.

- Identifying applicable policies and guidelines for researchers or, if need be, establishing policies and adopting guidelines for them to understand requirements for protecting human participants, sharing of data, the mission and research scope of the institution, available support resources, and procedures for review and approval of the research proposals.
- Ensuring compliance with applicable laws, regulations and institutional policies on human research and protection of personal information.
- Designating responsible individual(s) or, when needed, establishing a central office to ensure awareness of research being conducted in the institution and ensuring that these studies are performed to high quality standards and aligned with institutional policies.
- Ensuring that institutional policies are inclusive, pay attention to removing biases in recruitment and promotions, and are gender-sensitive.
- Ensuring that all involved services and committees within the institution are gender-balanced and representative of the populations in which research is conducted.

- Ensuring that researchers are duly informed of the mission and research scope of the institution, the available supporting resources, and the procedures for review and approval of research proposals.
- Institutions that are primarily intended for the provision of services should define their research goals and approaches, considering their legal and social mandate towards the population served and their capability to ensure compliance with quality standards of health research with the existing infrastructure and human resources.
- Depending on the intensity of research activities, developing and implementing standard operating procedures (SOPs) for interactions between investigators and the institution´s research-coordinating individuals or entities. The SOPs should specify requirements that researchers, including research staff, should follow during the planning and review of their research proposals, and then during the implementation and conduct of the approved studies.
- Ensuring that the research plan is feasible and that the institution and the researchers have the necessary resources to fulfil their obligations derived from conducting the study, for example the retention of source documents and regulatory files for potential inspections and/or for re-contacting participants after the closing of the study, if needed.
- Ensuring that data collection is well standardized in the institution and follows the ALCOA+ principles as described in Chapter 4. Collection, storage, and use of data and/or biological materials in health-related research.
- Evaluating and mitigating the potential impact of diverting institutional human or material resources from healthcare activities towards research activities.

10 — Scientific value and appropriate research plan

The goal of health-related research is to generate or contribute to generalizable or transferable knowledge about health, illness and disease. This applies to quantitative, qualitative and mixed methods research. An appropriate and rigorous design and careful conduct of research helps to protect participant safety and generate reliable evidence.

A rigorous research proposal requires knowledge of particular areas of science and related research, reasons for using a specific approach to answer the research question(s), and attention to whether the approach is feasible. A written research proposal or protocol should describe the study's justification, objective(s), design, methodology, statistical considerations, organization of the study, qualifications of the research team, and other information to ensure the safety of participants and the quality and the integrity of the data collected.

Research institutions should give special attention to the following.

- Ensuring clear and concise, written research proposals or protocols that describe the study's justification, objective(s), design, outcomes, methodology, statistical considerations, organization of the study, and other information.
- Considering adoption of a standard template for writing research protocols, based on existing country-specific or study topic-specific templates. Although the component parts of a given research proposal may differ from the template for a variety of reasons, every research proposal should clearly state what the research question is, why it is important, how it

improves upon what is already known, and how the design, methods, and procedures will be used to answer the question and determine the primary outcome(s).

- Even though the ICH recommendations for good clinical practice (ICH GCP) are intended for the conduct of interventional trials with drugs, compliance with ICH GCP for other health-related research could be considered, when applicable, to provide public assurance that the rights, safety and well-being of participants are protected.
- Ensuring that the study design is consistent with accepted scientific principles, appropriate for answering the research question, and ethically acceptable. There should also be a feasible and clear plan for how data will be collected, analyzed, and reported in a scientifically appropriate manner.
- Ensuring that the research protocols are attentive to sex and gender and inclusive of race, ethnicity, age, and other relevant variables.
- Ensuring that sex and gender considerations are taken into account during data collection, and analysis, and that sample sizes allow for disaggregated data analysis based on sex and gender considerations and other relevant variables, or providing justification when they do not.
- Ensuring that the research is feasible and that the institution has the necessary resources and infrastructures to successfully complete the proposed research in order to avoid research waste as much as possible.
- Considering implementing "Sex and Gender Equity in Research" (SAGER) guidelines if relevant for the research.
- Considering including participants or their representatives and/or health care users in the process of study design (patient and public involvement and engagement, PPIE) in order to avoid a mismatch between what researchers want to do and what patients and local communities need, and to improve the social value of the study.

11 — Scientific rigour—review and training

The planning and conduct of quality health-related research require a thorough and up-to-date knowledge of the study-specific topic, as well as expertise in matters of scientific methodology, statistics, bioethics or research ethics, quality management, and legal and regulatory issues applicable to human research, patients' rights, and protection of personal information.

Institutions should provide and support mechanisms for reviewing, evaluating and overseeing health-related research. Such mechanisms are important to ensure scientific quality, reduce possible biases and waste, fulfil ethical standards, comply with regulations and laws, protect participants and other stakeholders, and maintain public trust. Some national laws allow for exceptions, but ethical guidelines and regulations require review by a research ethics committee (REC) before a health-related study begins. In addition, the scientific quality of the proposed research must be assessed, as "bad science is bad ethics" and wastes resources. From that perspective, qualitative health-related research needs to be evaluated on the basis of its own scientific criteria (for example "trustworthiness" instead of validity and fidelity).

Research institutions should give special attention to the following.

- Ensuring appropriate review of the science and scientific rigour of a proposed research design and plan. Scientific review should be performed by the competent REC or an appropriately constituted one. Alternatively, independent scientific review by a scientific review committee or designated individual(s), a peer review group, or some other mechanism is recommended, and should include individuals who have the expertise to evaluate the scientific questions and the methods proposed.
- Ensuring that investigators and research team members have the proper skills and knowledge in the specific disciplines and research field to conduct the proposed research. This may include knowledge and skills in the scientific and professional area as well as in appropriate and rigorous research methodologies.
- Considering providing—or referring to—initial and ongoing training on ethical standards, good practice and local and international regulations applicable to human research; scientific methodology in quantitative and qualitative research depending on the needs, biostatistics; and scientific writing.
- Providing human resources, whenever possible, such as methodologists, statisticians, research coordinators, and others who are experienced with the specific kinds of research being conducted in the institution and can support the investigators and research teams, or be part of the research team.
- Establishing a culture committed to the responsible conduct of science (see Point 7 on scientific integrity in Chapter 2).
- Establishing a mechanism to monitor data and participant well-being throughout a research study (Chapter 9. Institutional research oversight).

TABLE 2. Summary checklist for research institutions to ensure scientific standards

Infrastructure	Expertise & training
▪ Coordination of designated institutional research official(s) or establishment of a research office ▪ Institutional policy and SOPs for researchers and other staff involved in research (support) activities	▪ Access to expertise in methodology, research design, statistics, etc. ▪ Training for researchers and research teams, and other key-staff involved in research (support) activities
Tools	**Review & monitoring**
▪ Standard templates for written research proposals/protocols	▪ Process for scientific and ethics review of the rigour in the design and conduct of research ▪ Plans for monitoring data

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CHAPTER 4.

COLLECTION, STORAGE, AND USE OF DATA AND/OR BIOLOGICAL MATERIALS IN HEALTH-RELATED RESEARCH

Background and principles

Collections of data and biological materials are important tools for health-related research that contributes to a better understanding of illness, diseases, health, health behaviours and the relationships between the various factors that influence them.

These guidelines cover all collections of data and/or biological materials including those where the data and material are not stored but directly used for a specific research project, as well as data and biobanks that involve secondary uses. They also cover all types of data and biobanks, including clinical and research data and biobanks. This approach is consistent with that adopted in the 2016 CIOMS "International ethical guidelines for health-related research involving humans" and the 2016 "WMA Declaration of Taipei on ethical considerations regarding health databases and biobanks".

Of note, the term **"use" of data and biological materials** covers collection, analysis, storage, transporting, archiving, sharing, exporting, reporting and destruction.

As stated in the 2016 CIOMS international ethical guidelines (Guideline 11), "When data and biological materials are collected and stored, institutions must have a governance system to obtain authorization for use and future use of these data and biological materials in research. Researchers must not adversely affect the rights and welfare of individuals from whom the data and materials were collected".

As a general rule, **proper governance and good custodianship** should protect the rights and interests of individuals and promote quality research including data integrity. The governance mechanisms should be comprehensive and correspond to the research institution's scope and intensity of research activities. The governance measures enable promises to be kept to participants, researchers, authorities, and other stakeholders in health-related research and foster trustworthiness. Any activity, operation or procedure carried out or established during the lifecycle of collection and use should follow the principles of transparency, accountability and inclusion of

interested persons in compliance with applicable national and international ethical and professional standards and legal requirements.

Institutions collect data and/or biological materials for different purposes, including routine diagnostic and clinical activities and research, but data collection is a more widespread practice than biological material collection. Institutions must respect data protection principles and ensure data integrity, quality, privacy and security. In handling biological materials, special attention must also be given to biosafety and biosecurity requirements, which can have significant impact in terms of responsibilities and liabilities.

Data handling in the context of health-related research requires two major components. Firstly, the institution should provide adequate **support and tools to record source data**. Indeed, the original medical records or patient files (and/or certified copies of original records) are the first place where some or all data relevant for a study are recorded, representing the source documents and source data of the research study (for instance according to ICH GCP 1.51 and 1.52 for clinical research). Secondly, the **data flow** in health-related research, meaning the transcription of the source data into a study database and their subsequent analyses should be well planned, in compliance with applicable quality and regulatory standards, and should ensure data integrity, quality, privacy and security. High quality of data (including source data, study data, as well as data collected in a databank and/or biobank) is a crucial condition for the validity of the outcomes of research projects.

In order to comply with the standards of good data handling, it is strongly recommended for the institution to have some basic tools in place to conduct health-related research, such as a clinical research information system (CRIS).

Points to consider and how to address them

12 — Responsibilities towards the participants

Participants who accept to provide data and biological materials for health-related research have rights and interests that must be protected throughout the lifecycle of a project or the duration of data collection and (re)use. The starting point is broad informed consent, together with confidentiality measures. These mechanisms alone are not sufficient to protect the rights of participants; other transparent measures and procedures must also be put in place. The participation of individuals depends on their trust in the institution, which is why it is also important to include participants in the development and execution of governance procedures whenever possible (see the 2016 WMA Declaration of Taipei, paragraph 20). The status of the broad informed consent (positive, negative or withdrawn) and the terms of the agreement should be checked on an ongoing basis during the collection of data and materials and during their use or further use.

Research institutions should give special attention to the following.

- Information and consent form: The informed consent could be specific for a known project, or broad if further use of data or biological materials is planned. Templates for both forms should be available. Separate information and consent forms should be available for legally

competent or incompetent adults and for children. Broad informed consent may be a good solution for biobanks and databanks aiming for data and biological materials storage for future use. For further requirements related to informed consent, see the 2016 WMA Declaration of Taipei (paragraphs 11-16) and the 2016 CIOMS international ethical guidelines (commentaries on Guidelines 11 and 12).

- Ensuring that a procedure for withdrawal of consent (how to contact, whom, where) and its consequences is in place. The way of handling data and biological materials after withdrawal of consent (de-identification, coding, anonymization and/or destruction) should be specified.
- Ensuring that a procedure is in place for children and adolescents to give their own informed consent or to withdraw consent when they reach the age of maturity.
- Ensuring follow-up of the consent decision (positive, negative, withdrawn) over time to make sure that the collected data and biological materials will not be used for research purposes if participants refused or decided to withdraw their consent.
- Ensuring that a general procedure is in place for re-contacting the participants, if needed.
- Ensuring that the researchers are mindful of, and pay special attention to, the inclusion of gender diverse populations as well as minority and other vulnerable populations in various aspects of the research project.
- Ensuring the confidentiality of the participants' data and biological material. For data, see Figure 5. 'Data lifecycle' under Point 16 below. Coding of the samples should be the rule. Only a limited number of qualified personnel should be able to link the code to the name of the source person (i.e. have access to the key). The roles and responsibilities of team members as well as their privileges and access rights should be defined and documented. For further requirements on confidentiality see the 2016 WMA Declaration of Taipei (paragraphs 10 and 21) and the 2016 CIOMS international ethical guidelines (commentaries on Guidelines 11 and 12).
- Ensuring that a procedure is in place to inform research participants and the general public about the ongoing research and research outcomes. This communication could be done through general communication channels (such as the public website of the institution) and/or be included in the annual report available to the public.
- Ensuring that a procedure is in place for return of results and disclosure of both solicited and unsolicited (incidental) findings. Particular attention should be paid to results that have an influence on the health of the participants. The procedure should explain which findings will be communicated to the participants, how and by whom. Participants may however refuse to be informed of these results. Consideration must also be given to children who were minors at the time when the research was conducted and subsequently reached the age of maturity. Their right to reconsider their consent must be implemented. For further requirements on return of results and disclosure of (un)solicited findings, see the 2016 CIOMS international ethical guidelines (commentaries on Guidelines 11 and 12).

13 — Access and transfer of data and biological materials

The use of stored data and biological materials implies first and foremost that researchers should have access to them. Rules of access and transfer, meaning who can request data and biological

materials and how, should be put in place, respecting the limits of the informed consent and the principle of fairness as set out in the "TRUST Code – A Global Code of Conduct for Equitable Research Partnerships", 2018 (articles 1 to 7).

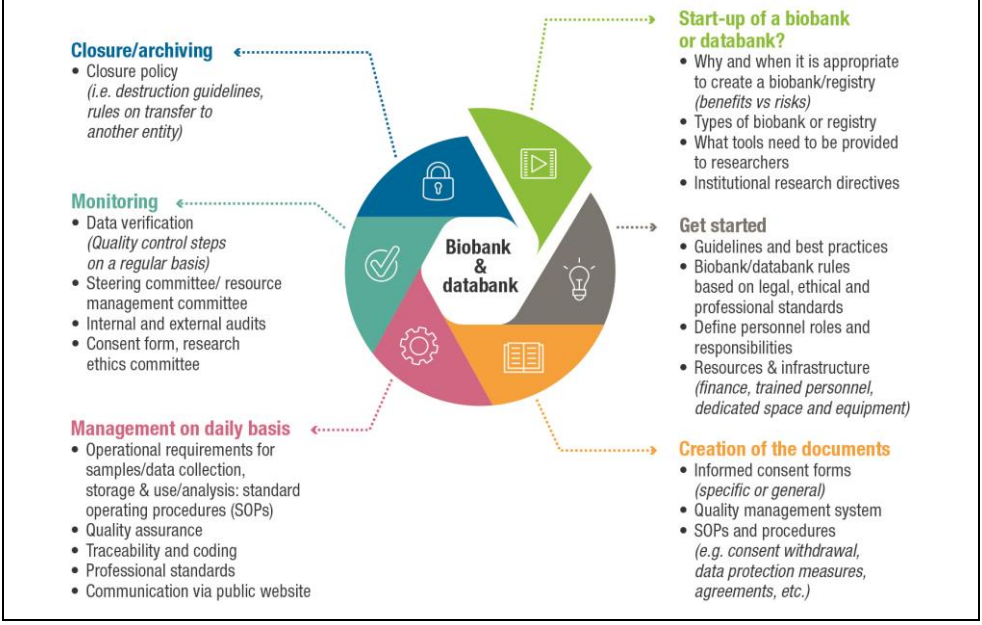
Research institutions should give special attention to the following.

- Ensuring that the rules for transfer of data and/or biological materials are clarified. A legal agreement, such as material transfer agreement (MTA) and/or a data transfer agreement (DTA), should be used for the transfer of data and biological materials for research. Such agreements may also be included in the research protocol. This allows research institutions and researchers to protect the rights of the participants and to keep the promises made through informed consent. If needed, templates of these documents should be made available to researchers. Research institutions should provide guidelines and/or designate dedicated experts to support researchers in adapting the templates to the settings of their research.
- Providing guidelines on the rules for sharing collected data and/or biological materials with different types of users, such as researchers from the same institution or other institutions, or those coming from the academic sector, the commercial industry or governmental bodies.
- Ensuring that a procedure is in place for handling requests for access to stored data and/or biological materials. If needed, a resource management committee can be set up to manage these requests. This committee could assess the scientific relevance of projects before sharing resources and check that projects are authorized by the relevant REC. The committee should include members representing different groups such as the management of the institution (e.g. at departmental or institutional level), researchers, healthcare professionals, and persons representing the participants and communities contributing to the biobank or databank. If data and biological materials come from participants in multiple countries, representatives from these countries can also be included in the committee.

14 — Biobanking & databanking

The minimum requirements for setting up a biobank and a databank include the designation of persons responsible for its management, the preparation of documentation outlining its structure and activities, and the availability of resources necessary to achieve its purpose. Resources include funding, qualified staff, infrastructure, a governance framework with provisions for patient and public involvement (PPI), and equipment, all of which must be planned for the long term. The institution has the responsibility to support researchers in their efforts to formalize their activities and assist with resource allocation or ensure that researchers have sufficient resources. A biobank and databank can only be qualified as an organized research setup if these minimal requirements are met and proper governance is in place.

FIGURE 4. Biobank & databank



Research institutions should give special attention to the following.

- Ensuring that the researchers have access to the guidelines and best practices available in the field (such as those listed in the references to these guidelines). Knowledge of relevant standards can be the first step in formalizing the types of biobanks or databanks, i.e. achieving biobank accreditation through ISO or other organizations.
- Providing or identifying a template of a document that describes the biobank or databank and its procedures, structures and rules (a Regulation) in accordance with the applicable rules; see the 2016 WMA Declaration of Taipei (paragraph 21) and the 2016 CIOMS international ethical guidelines (commentaries on Guidelines 11 and 12). The Regulation should include the description of the biobank and/or databank and present the governance mechanisms. Guidelines can be made available to support researchers in adapting the template to the settings of their biobanks or databanks. The institution should consider having internal dedicated experts for advice and support to ensure that the information described in the Regulation corresponds to actual practice, that the structures described in it are actually in place, and that the rules and procedures correspond to daily management.
- Ensuring the designation of the person(s) responsible for a biobank or databank, with clear roles and responsibilities.
- In line with the principles of patient and public involvement and engagement (PPIE), offering opportunities for participants and their communities or their representatives to be involved in the structures of the biobank or databank and/or in the creation/revision of the governance documents, including but not limited to informed consent forms.

- Ensuring the availability of sufficient financial, personal, and material resources: The first step is to define the objectives of the biobank or databank and identify the resources needed to achieve them. Then it is necessary to identify the resources currently available to the institution or directly to researchers and to find a balance between the available resources and the planned objectives. The resources considered should include financial support (as described in a clear and transparent financial concept), qualified staff (i.e. enough persons with appropriate qualifications and training), and infrastructure/equipment, with a procedure for the acquisition and maintenance of the equipment and space.
- Ensuring that procedures are in place to handle the end of activities and changes of ownership.

15 — Operational requirements for the collection, storage and use of data and biological materials

The operational measures must ensure the quality, security, integrity and privacy of the data and biological materials throughout their collection, storage, and use. For this purpose, a system for traceability should be set up and a basic quality management system (basic quality documents) should be available to the researchers. Traceability is also important to enable participants to exercise some of their rights (e.g. withdrawal of consent and its consequences). For specific requirement regarding data, see Figure 5 – 'Data lifecycle'.

Research institutions should give special attention to the following.

- Ensuring that the collection of source data and study data (electronic and/or paper-based) follow the ALCOA+ principles, namely: data should be attributable, legible, contemporaneous, original, accurate, complete, consistent, enduring and available.
- Ensuring that standard operating procedures (SOPs) are available and operable, describing how technical and/or administrative activities are conducted, including detailed processes addressing what, who, where and how these are to be performed.

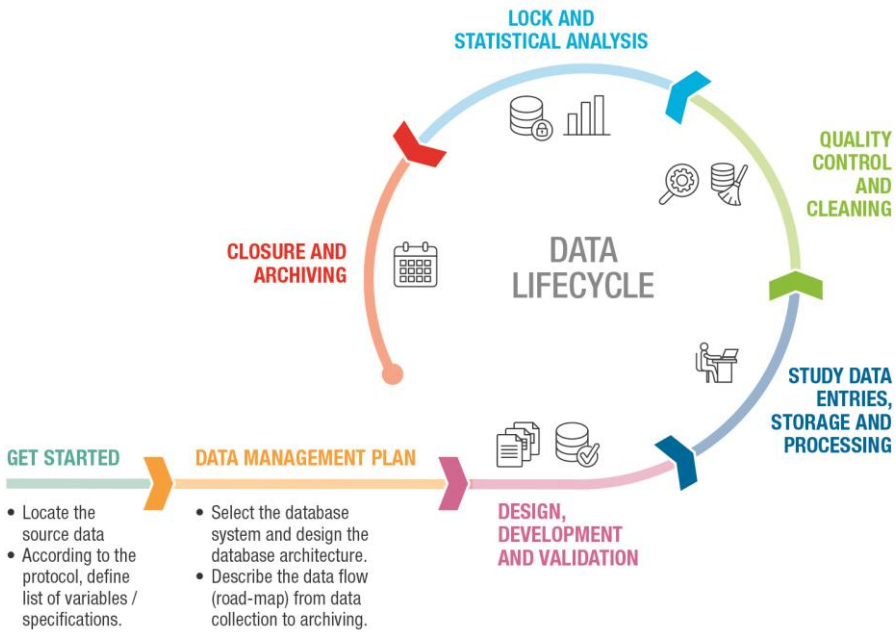
Specifically for biobanks, special attention should be given to:

- Ensuring that the facilities and equipment of the biobank are aligned with its overall missions / objectives. In particular, the biobank room must provide a safe space for the staff and for the biological materials stored, with controlled access.
- Ensuring that policies regarding biosafety measures related to work in the laboratory are in place.
- Ensuring that policies regarding the transportation of samples to and from the biobank/biorepository are in place.
- Ensuring that appropriate records and/or laboratory information management systems (LIMS) or other systems containing all relevant information—including the sex of the source of the biological material, see also "Background and principles" in Chapter 3—are in place to track the movement of biological materials from collection through storage, retrieval and return.
- Ensuring that a procedure regarding medical waste is in place that can be used for disposal and destruction of biological materials.

16 — Data lifecycle

Data management or data lifecycle is the process of collection, cleaning, and management of data in compliance with regulatory standards. The primary objective of the data management process is to ensure data accuracy, integrity, quality, privacy, and security. The tools available for researchers in the institution should support all the steps of the data lifecycle in order to improve the quality of the primary data collection but also to facilitate the conduct of the study and support data quality control.

FIGURE 5. Data lifecycle



Research institutions should give special attention to the following.

- Having in place a template of a document, such as a data management plan (DMP), that describes the procedures to be followed in the preparation and documentation of data collection (e.g. in an electronic database). This document should describe all the steps of handling data, from collection to archiving, as illustrated in Figure 5. Data lifecycle.
- Ensuring that the database system used in the institution to support a study, clinical and research databank and biobank is designed to prevent errors in data collection, modification, maintenance, archiving, retrieval or transmission. If an electronic database cannot be used in the institution for any reasons, the data flow must be well documented.
- Ensuring that simplified guidelines are in place and/or dedicated experts are available to guide the researchers in the different processes of database design, development and validation.

- Ensuring that study data are stored in such a way that backup copies can be easily and frequently made. In principle, paper documents should be scanned, stored, and archived electronically; they will be either included with the backup with other study files or stand-alone. A well-organized collection of paper documents may be better than a disorganized directory on a server, and can be used for all types of research.
- Ensuring the availability of a physically secured room with controlled access where researchers can archive all the study paper documents, and of adequate, dedicated electronic spaces on secure servers to archive all the electronic study data.
- Database servers should be physically secured with controlled access. Direct access to database servers should be restricted to individuals who are responsible for system monitoring and data backup.
- Ensuring that the institution has a process in place to perform quality control and data cleaning either electronically or manually (see also Chapter 9. Institutional research oversight);
- Ensuring that the institution has a process in place to make the research databank openly available for reuse by the community after the data publication process, in accordance with the "FAIR Guiding Principles for scientific data management and stewardship" and/or Open Science (see Footnote 11 on page 10), whenever applicable.

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CHAPTER 5.

FINANCIAL MANAGEMENT AND BUDGETING

Background and principles

While areas such as research ethics, research participants' protection, regulatory and legal compliance, management, data disclosure and publication are commonly discussed in health-related research, attention to budgeting and financial management is relatively limited. This may be attributable to the wide diversity of financial objectives, funding sources, funding structures and financial management policies among research institutions and research teams involved in different types of health-related research, making it difficult to recommend a generalizable budget structure and financial management policies applicable to all research institutions.

Quality has a cost, but **poor quality may induce an even higher cost** to research institutions. Inappropriate or inefficient financial planning and management could jeopardize the management of research institutions and their research projects. It may hamper an institution's success and sustainability and the quality of its research projects, and even compromise its primary mission as well as the interests of research participants and the public.

Whilst recognizing the diversity in financial objectives, policies and practice among research institutions, this chapter outlines **four key areas** in financial management for consideration by research institutions:

- **institutional resources planning**;
- **project budgeting**;
- **financial administration**; and
- **financial compliance**.

Points to consider and how to address them

17 — Institutional resource planning

Setting up good governance practice for a research institution is a substantial and long-term commitment, which requires:

- investment on initial setup;
- allocation of resources for the institution's continuous operation; and
- availability of resources for individual research projects.

Manpower, facilities and equipment are the major resources required by any research institution, but viable institutions need more than these. Depending on the targeted scopes and volume of research, research institutions may have their specific cost structures and therefore different sets of cost items. Common cost types and cost items are listed in Table 3.

TABLE 3. Common cost types and cost items in research institutions

Cost type:	Initial setup costs	Recurring costs	Project costs
Cost category:	---------- Cost item examples ----------		
Facilities & equipment			
Spaces, fixtures & fittings	▪ Renovation, furniture	▪ Repairing & maintenance	▪ Project-specific facilities
Equipment	▪ Office equipment, research equipment	▪ Repairing & maintenance	▪ Project-specific equipment
Staffing			
Salaries & benefits		▪ Management staff, research/technical staff, supporting staff	▪ Project-based staff
Training & development		▪ Training courses, conferences, meetings	▪ Project-specific training & meetings
Information technology (IT)			
Hardware	▪ Servers, computers, handheld devices, accessories	▪ Repairing & maintenance	▪ Project-specific hardware
Software subscription	▪ Software licence subscription	▪ Software licence renewal	▪ Project-specific software subscription & renewal
Application development	▪ Tailored application development	▪ Application maintenance, debugging & upgrading	▪ Project-specific application development & maintenance
IT services		▪ Data hosting, cloud services, information security services	▪ Project-specific IT services

(continued)

Cost type:	Initial setup costs	Recurring costs	Project costs
Table 3 (continued)			
Cost category:	----------	Cost item examples	----------
Compliance & risk management			
Licences	▪ Initial licence applications	▪ Licence renewal	▪ Project-specific licences/permissions
Accreditation	▪ Initial accreditation applications	▪ Participation in accreditation programmes	▪ Project-specific accreditation application & maintenance
Business insurance		▪ Medical malpractice, professional indemnity, public liability, property risk	▪ Project-specific insurance
Operating expenses			
Utilities		▪ Electricity, gas, water	▪ Project consumption
Consumables		▪ Office consumables, research consumables	▪ Project-specific consumables
Telecommunication, postage & courier		▪ Phone/fax lines, international courier	▪ Communication with collaborators & research participants
Travelling & accommodation		▪ Local transportation, overseas trips	▪ Attending project meetings
Communication, public engagement & marketing		▪ Communication/ marketing materials, public engagement/ marketing events, newsletters, websites, social media	▪ Project promotion, research volunteer recruitment, medical writing, publication
Outsourced services		▪ Housekeeping, warehouse	▪ Project-specific services

Individual research projects should in general be funded by project-specific resources such as research grants and industry sponsorship. Researchers are responsible for soliciting the required grants/sponsorship by leveraging their research merits which address scientific, social and public health needs. Establishment and maintenance of a research institution's human, facility and system infrastructure, however, should be financed by a combination of recurring revenue streams and alternative revenue streams as outlined in Table 4.

TABLE 4. Examples of recurring and alternative revenue streams available to research institutions

Recurring revenue streams	Alternative revenue streams
▪ Research institution's regular funding ▪ Research institution's regular business income ▪ Indirect fees (also called overhead fees) generated from research projects	▪ Non-recurring government funding ▪ Charity funding ▪ Donations ▪ Special grants ▪ Research institution's reserve funds

Initial steps toward good governance practice of a research institution could be financed by one-off alternative resources, depending on its type and scale. Continuing maintenance and operation should be funded by recurring revenue streams to ensure long-term sustainability. Dedicated research institutions are regularly engaged in many research projects and may generate sufficient revenue streams by charging indirect fees (also called overhead fees) to cover the related overhead budgets. Non-dedicated research institutions, however, may not have a stable and sufficient number of research projects to achieve a sustainable level of income. Hence, commitment by institutional management to continuously allocate sufficient funds from their recurring institutional budgets is necessary. It is important to note that commitment of recurring revenue streams does not necessarily imply perpetual allocation of substantial budgets. A research institution with a small number of research projects may easily kick-start its research programme with a small budget covering only basic costs (e.g. minimal staff and facility costs). If and when research activities start to increase, contributions from indirect (overhead) fees will increase in parallel and gradually become the major financial resources for supporting the institution's continuing operations.

18 — Project budgeting

Most research institutions, in particular public institutions or charities, do not aim to earn profits from their research projects. However, they should follow the principle of **cost recovery** to ensure that sufficient resources are available for their projects to be conducted in accordance with all ethical, legal and quality standards.

Different funding bodies may have different requirements for budget structures and presentation, and different research institutions may have different financial management policies. This section primarily gives general guidance to research institutions and their researchers on preparing their research budget proposals from three key perspectives: (1) direct and indirect costs; (2) budget structure; and (3) payment terms and schedules.

Direct and indirect costs: A project budget usually comprises direct costs and indirect costs. Direct costs are directly incurred from project activities, whilst indirect costs do not directly arise from a project but are apportioned from an institution's general overhead costs and expenses such as office facilities and administrative costs. Table 5 gives some examples.

TABLE 5. Examples of direct and indirect costs for research projects

Cost type	Direct costs	Indirect costs
Staff costs	▪ Salaries of research staff specifically employed for the research project ▪ Apportioned manpower costs of existing research staff	▪ Salaries of general administrative staff
Equipment and supplies	▪ Project-specific equipment ▪ Project-specific software ▪ Research evaluation tool licences ▪ Project-specific consumables (e.g. laboratory, drugs etc.)	▪ Licence fees for general software ▪ Maintenance fees for general equipment ▪ Rental of research institution's general offices
Data communication	▪ Wide area network (WAN) set up specifically to meet the requirements of a research project	

Since it is not straightforward to objectively apportion indirect costs to individual projects, research institutions usually apply a standard overhead charge as a percentage (e.g. in the range of 15-30%) of the direct costs for easier budgeting and administration. A research institution should consider its funding structure and set a reasonable overhead charge rate which aligns with the principle of cost recovery and at the same time allows for sufficient resources to be allocated to cover the direct project costs.

Budget structure: A specific budget structure may be imposed by funding bodies, but the principles of budget estimation remain valid. For instance, the budget structure requested by governmental funding bodies may adopt a modular concept, i.e. a budget presented as a lump-sum for each area of activities (e.g. protocol development, statistical analysis). For commercial driven studies, however, sponsors normally request a detailed presentation of itemized costs in the form of a budget spreadsheet under three major categories:

- fixed costs (i.e. basic costs that are incurred for setting up a project irrespective of the actual number of research participants recruited in the project or research activities performed);
- per-participant costs (i.e. costs that are incurred from the participation of each research participant); and
- line item costs (i.e. costs that are incurred only if a certain activity is performed).

TABLE 6. Budget structural categories and examples of corresponding cost items for research projects

Budget structural categories	Examples of cost items
Fixed costs	Professional indemnity and insurance, research ethics committee fee, participants recruitment, regulatory submission fee, pharmacy setup cost, laboratory tests setup cost, drug cost
Per-participant costs	A summation of cost of performing study procedures per each study visit (per visit cost) during the entire study for each participant. Example of cost items for study procedure: conducting informed consent, checking eligibility criteria, performing physical examination, data collection, performing internal quality check, drug dispensing, subsidy to volunteer
Line item costs	Laboratory tests or imaging assessments that will only be performed if needed

Payment terms and schedules: In addition to the total amount under a budget, **cashflow** is also very important. Despite the variation of budget structures, research institutions should pay attention to the payment terms and schedules to ensure that sufficient funding is received for covering the expenses at different stages of a research project. For example, if the first payment under a budget will only be received by the research institution upon recruitment of 100 volunteers, the institution and the researcher may not have resources to set up the project and perform the work before recruitment is completed, and the project could end up a failure. Close monitoring of project progress and regular processing of payments (e.g. quarterly) during the project period are therefore highly recommended.

19 — Financial administration

Researchers are experts in health and science, but may be less skilled in finance and accounting. Nonetheless, proper administration of financial transactions and maintenance of financial records, from beginning to end of a research project, are essential to ensure financial compliance and to facilitate financial audits, irrespective of the nature of funding received. Research institutions should therefore assist researchers in managing financial transactions, maintaining accounting records and preparing financial statements by:

- providing routine consultancy services to researchers via the institution's research administration office or finance department;
- organizing regular training workshops on financial administration and compliance;
- developing financial statement templates specific to health-related research, for reference by researchers; and
- supporting internal and external financial audits.

Institutions that are dedicated to research and have a high and sustained volume of research projects may consider establishing a central research office to undertake the aforesaid financial administrative duties in collaboration with their researchers.

20 — Financial compliance

Financial compliance is crucial in health-related research projects, whether supported by public or private resources. In particular, research institutions should establish appropriate guidance and mechanism to avoid conflicts of interest, bribery and corruptive actions.

Without prejudice to other chapters discussing the importance of declaration of conflicts of interest, it is strongly recommended that research institutions and researchers undertake the following measures to avoid any perceived or real conflicts of interest from the perspective of financial management:

- **Transparency:** Research budgets and financial statements should be open for independent audits and inspections by internal quality departments and regulatory agencies.
- **Documentation:** Budgets should be organized in tables with detailed cost items and breakdowns to ensure there are no hidden costs. Procurement records should show that—where possible—more than two quotations have been collected from different vendors for items to be procured to avoid procurement bias.

Research institutions should ensure that their researchers observe all applicable local and international laws and regulations in relation to anti-bribery and anti-corruption, e.g. the U,S. Foreign Corrupt Practices Act (FCPA), or the UK Bribery Act.

When a research project is supported by a third party, the research budget must be prepared based on the actual procedures and requirements defined in the study protocol without taking into account any other business relationships. It is also recommended that a research budget should be compiled according to the principle of "fair market value", which can be demonstrated by documented market information and consistency across research projects. In case a project is funded by multiple sources, repeated budgeting for the same cost items must be avoided. If an

agreement is executed between a funding body and a research institution, it should specify that all the payments by the funding body under the agreement should be made only to the research institution, not directly to the researcher or any individual person; this will avoid any possibility or suspicion of bribery.

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CHAPTER 6.

COLLABORATION

Background and principles

As noted in Chapter 1, each research institution—like any other organization—exists for a specific social purpose. With the rapid advancement in health sciences, an increasing awareness of diversity (whether socio-economical, ethnic, cultural, gender or otherwise) and increasingly stringent ethical, regulatory and quality requirements worldwide, health-related research is becoming more challenging. Challenges can be even greater for those organizations that carry out research outside their core mandate, such as some NGOs and international organizations. Research institutions may therefore encounter constraints that limit them in achieving their research objectives on their own. Collaboration between research institutions and/or with other partners should be considered as opportunities to help overcome such constraints.

Collaboration is the act of two or more parties working together within a mutually agreed scope to achieve certain goals that bring **shared benefits or outcomes**. A collaboration could be established for a particular project or event (e.g. a research project, a joint research seminar, etc.), or for a strategic purpose covering a certain scope or series of projects or activities (e.g. a research programme consisting of a number of research projects around a certain discipline, a long-term research personnel development programme involving exchange and placement of staff, etc.). A successful collaboration may, in addition to achieving the defined collaboration goals, also bring extended short, medium- and long-term benefits to the concerned institutions, the researchers and the research community at large, by:

- supporting the achievement of the research institutions' organizational missions;
- supporting the development of new research and research-supportive skills and capacities;
- supporting the upgrade of the research institutions' infrastructure and skills;
- creating and/or supporting long-lasting collaboration among researchers;
- encouraging and facilitating exchange of good research and governance practices;
- developing a larger network of like-minded institutions; and
- contributing to the continuing improvement of the local, national and/or international research environments.

In the domain of health-related research, collaborations are usually driven by researchers with common research interests. It is very important that research institutions—in line with their research scopes and missions—offer necessary and appropriate support to their researchers and exercise good governance over their collaborative projects and activities.

Collaboration is not a purpose in itself, but it can facilitate the achievement of the research purposes of research institutions and their researchers. To work out a **meaningful and fair collaboration** that creates value for all collaborating parties, it is highly recommended that research institutions and researchers do the following prior to the start of the collaboration:

- get themselves ready for collaboration in terms of, for example, their policies, resources, personnel and infrastructure;
- identify suitable collaborators;
- formulate a collaboration plan and define the way of execution; and
- stipulate the agreed terms and conditions in a collaboration agreement (or equivalent).

It is also highly recommended that research institutions continue to oversee the performance of collaborative activities throughout the entire period of collaboration (see Chapter 9. Institutional research oversight) and evaluate the immediate outcomes upon conclusion of the collaboration and, when applicable, the long-term outcomes at defined times after its formal conclusion.

Points to consider and how to address them

21 — Identifying suitable collaborators

Identifying suitable, like-minded collaborators is the pre-requisite for a successful collaboration. Depending on the subject domain and context, a research institution may collaborate with groups and entities such as:

- other public or private health research institutions;
- non-health research institutions (for instance, in the field of economics and other social sciences);
- industry/commercial corporations;
- patients, families, caregivers, patient organizations, patient representatives and persons with lived experiences;
- professional associations;
- governmental bodies;
- international organizations;
- non-governmental organizations or charity organizations;
- specialized bodies (e.g. diagnostic reference laboratories); and
- funding bodies.

Solid collaboration among collaborators is founded on three fundamental elements:

- common research interests;
- shared values and common goals of collaboration; and
- complementary qualities/elements that justify the collaboration.

No two research institutions will ever be the same, but in order to work together it is important that they share certain common research interests, common values and common goals. Furthermore, it is desirable that collaborators carry complementary qualities or elements—whether in terms of expertise, capacity, financial resources, human resources, facilities, time, regulatory environment, access to research population, local culture or otherwise—that supplement the limitations of the other collaborators and/or enhance the synergistic outputs of the collaboration.

For example, university epidemiologists, university social scientists, patient organizations and homes for the elderly in a city may all be interested in exploring the pattern of spread of an infectious disease in the elderly population, and have the common goal of protecting the health of the elderly by preventing disease transmission within confined nursing facilities using an evidence-based approach. On these common grounds, they could jointly organize a collaborative research project on the subject, utilizing their complementary strengths, under which the university, epidemiologists, publics and social scientists offer their research personnel and (research) expertise, and the nursing homes offer their expertise in elderly care and provide access to their facilities and potential research participants.

In spite of the wide diversity of research institutions, it seems critical that special attention is paid to the principle of **fair partnership** between institutions and collaborators from various disciplines, as promulgated by the Council on Health Research for Development (COHRED), in three domains:

- **fairness of opportunity** to contribute to the collaboration (e.g. in terms of defining the collaborative scope, goals, methodologies, management mechanism, roles, financing and contractual arrangements, etc.);
- **fair process**, which refers to the fair management and operation of a collaboration (e.g. in terms of data use and ownership, transfer and future use of biological materials, centralized versus decentralized processes, etc.); and
- **fair sharing of benefits/outcomes and costs/liabilities**, which refers to the fair sharing of collaborative benefits/outcomes corresponding to each party's inputs and contributions, both at research institution's and researcher's level (e.g. authorship policies, intellectual property rights, technology transfer, training opportunities, etc.) and the undertaking of costs/liabilities corresponding to each party's responsibilities (e.g. insurance, indemnity).

22 — Collaboration plan and concerted execution

Research institutions may have different practices and follow different standards applicable to their own scope of activities. To ensure that all collaborating parties will work towards the common goals and deliver the expected outputs, it is important that they jointly formulate a collaboration plan and define the way of execution.

A **collaboration plan** generally consists of essential components including but not limited to:

- **the context of collaboration**, detailing the objectives, rationales, arrangements, deliverables and expected outcomes of collaboration (and in case of a collaborative research project, the research protocol);
- **a duties allocation plan** defining the delegated roles and responsibilities of each collaborating party;
- **a time plan** defining the key milestones and estimated time schedule;
- **a financial plan** setting out the budget, funding sources and cash flow (see Chapter 5. Financial management and budgeting); and
- **a compliance, quality and risk management plan** listing the ethics, regulatory and quality standards to be followed (see Chapter 2. Ethics, law and scientific integrity), the measures to be applied to monitor compliance (see Chapter 9. Institutional research oversight), and the measures to be taken to prevent and control risks (see Chapter 1. Research institution management).

It is important to note that, even if the specific formulation of the plan will depend on the kind of research to be conducted, these five components are applicable across all research disciplines. For instance, the specific measures to be applied to monitor compliance will differ between clinical trials, epidemiological studies, pharmacoeconomic studies and behavioural studies, but monitoring compliance is equally important in all these studies.

The **effective execution** of a collaboration plan relies on the concerted efforts of all collaborating parties. It is therefore recommended that research institutions and researchers pay attention to:

- **governance** by jointly establishing and authorizing a steering committee (or equivalent body) governing the collaboration, with documented terms of reference and a record of key decisions made;
- **sharing of responsibilities** by fairly allocating responsibilities among the collaborating parties, with special attention to avoiding asymmetries of power;
- **delegation of project team** by appointing the representatives (e.g. project managers, coordinators, data managers, field data collectors, etc.) who will perform communication, management and operational tasks on behalf of the collaboration; and
- **communication and execution** by defining the method of communication (e.g. by regular meetings, progress reports) and aligning the practical arrangements for performing their tasks (e.g. how data are collected, analyzed, interpreted, stored, accessed, transferred, published and disseminated, etc.).

23 — Collaboration agreements

To ensure that a collaboration is fully transparent to all the collaborating parties and to avoid misunderstandings and disputes, it is highly recommended that the detailed terms and conditions of collaboration (in particular each party's rights, responsibilities and liabilities) are clearly

stipulated in a collaboration agreement (or equivalent) among the collaborating research institutions. The agreement terms and conditions should reflect the **core principles** of:

- **fair partnership** as outlined in Point 21 above;
- **ethical and legal conduct**, where all the parties share the responsibility of complying with the applicable ethical and legal requirements in performing their tasks under the collaboration; and
- **transparency and accountability**, with public disclosure of collaborative activities and results being warranted and planned for any health-related research, irrespective of research disciplines and contexts.

In this context, it is recommended to pay special attention to the **contractual provisions** of the agreement, notably with regard to:

- applicable national and international ethical and legal standards;
- data and sample rights and ownership;
- intellectual property rights and ownership;
- publication and public disclosure of results;
- data protection;
- right of termination; and
- liabilities, indemnity and insurance.

Lastly, it is important to **involve all relevant persons** in a timely manner in developing the agreement, i.e. the legal professionals, researchers and management executives who are familiar with the planned collaboration, with the support of a research collaboration office/unit where applicable. This will ensure that all legal, scientific and operational perspectives are well considered and the agreement is practically operable. The agreement will be entered in the capacity of the collaborating institutions and executed by their authorized representatives to ensure enforceability. The responsible researchers and/or key personnel may also be required to provide their written acknowledgement of the agreement to confirm their understanding and consent to the terms and conditions.

For clarification, the existence of a collaboration agreement does not eliminate the need for other specific contracts or agreements (e.g. material transfer agreements, data sharing agreements).

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CHAPTER 7.

COMMUNICATION

Background and principles

As mentioned in previous chapters, each research institution has a specific mandate and social purpose. With the rapid advancement in health sciences, the availability of multiple ways of communicating within and outside the scientific community, and the increasing societal awareness of the need of accountability and transparency, both research institutions and individual researchers face increasing challenges in adequately communicating on their research undertakings and findings. Nonetheless, transparent communication is essential for ensuring **internal and public accountability** and thus for realizing the social and scientific value of health-related research.

It is recommended that a communication plan is articulated at various levels.

- Internally, within the research organization or consortium (see also Chapter 1. Research institution management); and
- Externally, towards:
  peers within the scientific community;
  institutions that oversee research (see also Chapter 2. Ethics, law and scientific integrity);
  the research community;
  the mainstream and social media; and
  policy-makers in health systems.

A well-designed **internal communication plan** should ensure that everybody in the organization and in the research consortium, including the public and patients, have clear and easy access to policies, procedures, decisions made etc. In addition, it will contribute to creating a climate of transparency, mutual learning and trust, and to the continuing improvement of research policies and practices.

In order to achieve effective internal communication, it is desirable that a research institution acts both at project level, i.e. by communicating on plans, policies and achievements about a specific research project, and at a broader institutional level, i.e. by communicating on scientific, ethics and legal policies and regulations that govern research and research supporting activities.

A well-designed **external communication plan** should support organizational and individual compliance with research ethics and integrity principles. In addition, it will contribute to building a

solid scientific reputation for the institution and for the individual researchers; and to the continuing improvement of the local, national and/or international research environments.

In order to achieve effective external communication, it is recommended that a research institution acts both at project level, and at institutional level. At project level, it is desirable to develop a communication plan that articulates who will initiate communication and be responsible for it; what information will be communicated; to whom (e.g. scientific community, policy-makers, lay public); how (i.e. using which communication tools or modality); and when (i.e. at what time points before, during and after completion of the research). At institutional level (see Chapter 1. Research institution management), it is desirable to develop policies enabling researchers to integrate transparency and integrity in research communication. For instance, there should be institutional guidance on communicating accurately and comprehensively on any research findings, whether positive, negative or inconclusive, in order to discourage a "publish or perish" institutional culture focusing only on bibliometric criteria (see Chapter 2. Ethics, law and scientific integrity).

Points to consider and how to address them

24 — Internal communication

Internal communication within a research institution or consortium is important to nurture an evidence-based and ethical research culture, uphold research standards and improve staff engagement. An internal communication plan is vital in ensuring that patients and representatives from the public who participate in the consortium have clear expectations about the collaboration and are treated with respect. An institution or consortium may consider delegating a unit or team (e.g. communication unit or officer, research office) to coordinate internal communication activities—including but not limited to the dissemination of institutional research policies and guidelines, updates on research project status and results, and responses to enquiries from research personnel—via suitable channels. Intranet pages where the stakeholders can easily access research policies, procedures and regulations, reference guidelines, organigrams, etc. have proven to be useful for effective internal communication. Periodical newsletters, internal emails with information on new policies or procedures, internal seminars for reflection on topics of common interests, and various types of meetings may also be considered.

For specific research projects, internal communication is normally led by principal investigators, and may be supported by delegated team members (e.g. study coordinators). Examples of useful approaches include regular and ad hoc project progress meetings, seminars and update reports. Project progress, funding utilization, quality and compliance issues, and specific challenges are common focuses.

In all cases, it is important that internal communication is designed and implemented in an **interactive** rather than unidirectional way, planning for spaces and tools to listen to the experiences and concerns of staff and research participants, and preparing to act upon them.

25 — External communication

The responsibility to define and periodically revise an external communication plan generally depends on the size and governance of a research project or programme (e.g. single-center or multi-country, involving a single institution or a research consortium, etc.). For instance, it can be the task of the principal investigator (PI), the study coordinator, the steering committee, or others.

Once the communication plan has been defined and agreed in writing, the execution of the different tasks should be delegated to the concerned function(s) in the research group. For instance, the PI and/or steering committee will likely be leading the communication toward the scientific community (Point A below) and policy-makers (Point E), while the study coordinator and field researchers will likely be leading the communication toward research communities (Point C). When possible, it is preferable that the communication via mainstream and social media (Point D) is led by communication professionals. While large research institutions usually have a communication unit or department, small research institutions may choose to seek the advice of communication experts when possible.

A. Communication toward peers within the scientific community

As stated in the 2016 CIOMS international ethical guidelines (Guideline 24), "public accountability is necessary for realizing the social and scientific value of health-related research. Therefore, researchers, sponsors, […] have an obligation to comply with recognized publication ethics for research and its results. Researchers should prospectively register their studies, publish the results and share the data on which these results are based in a timely manner. Negative and inconclusive as well as positive results of all studies should be published or otherwise be made publicly available". Therefore, it is important that a communication plan makes provision for the following.

- Registration of the research protocol in a registry recognized by the World Health Organization (WHO)'s International Clinical Trials Registry Platform (ICTRP). This only applies to clinical trials and other prospective research in humans that fall under the policy of the International Committee of Medical Journal Editors (ICMJE).
- Clear criteria and modalities for sharing de-identified research data and samples from the research. It is generally preferable to frame them in a general institutional policy for data and sample sharing (see Chapter 3. Scientific standards);
- Plans for the dissemination of research findings, including interim results when applicable, through presentations at scientific conferences, (possibly) pre-prints, publications in peer-reviewed journals and/or open clinical research registries. It is recommended that communications at conferences and pre-prints are rapidly followed by submission to a peer-reviewed journal. For peer-reviewed publications, preference should be given to open-access journals, and care should be taken to avoid "predatory journals" that focus on marketing and have poor peer-review practices.

B. Communication toward institutions that oversee research

Any health-related research projects are overseen by at least one research ethics committee (REC) or institutional review board (IRB). Furthermore, certain kinds of research can be subject to

the oversight of other bodies and institutions such as the regulatory authority, the national public health institute or others (see Chapter 2. Ethics, law and scientific integrity).

While it is generally the responsibility of the PI or appointed study coordinator to proactively and reactively communicate with such bodies, it is an organizational responsibility to create an institutional culture where individual researchers and staff are aware of the relevance of timely and transparent communication with these bodies, both for planned tasks (such as submitting initial protocols and amendments, sending yearly reports, etc.) and unplanned tasks (such as promptly communicating any events or occurrences that may impact the feasibility, acceptability or findings of the research project).

C. Communication toward the research community

The 2021 CIOMS consensus report on "Clinical research in resource-limited settings" states the need for formal plans to communicate with participants and their community in a sustained and meaningful way; and the 2016 CIOMS international ethical guidelines (in the commentary on Guideline 24) state that "Researchers must also communicate the results of their work to the lay public. Ideally, researchers should take steps to promote and enhance public discussion. Knowledge resulting from the research should be made accessible to the communities in which the research was conducted, either through publication in scientific journals or through other channels". Therefore, the communication plan should describe how the research plans, tools, conduct and findings will be practically communicated to and discussed with the research community, in generally understandable languages and on an ongoing basis.

The communication plan will ideally include details on who will be responsible for this task; which relevant stakeholders (such as patient associations, local associations, community opinion leaders, community advisory boards, etc.) will be engaged locally; by which means the communication will be channelled and discussions will be organised (such as through structured meetings, mailings, local media, etc.); and how scientific content will be translated into lay language. Importantly, a budget line should specifically be dedicated to activities needed for engaging the relevant communities.

D. Communication toward mainstream and social media

Research institutions or consortia can decide to use a general and/or a study-specific website to inform the public on an ongoing basis about a given research programme. They can also use press releases for rapidly informing the general public about the start of a given research programme, the achievement of a milestone during the research, or key research findings. Depending on the nature and mandate of the institution, press releases are often drafted by communication or public relations experts; however, to keep up with the principles of transparency, accountability and honesty, it is highly recommended that scientists (PI and other key researchers) review the contents for accuracy, and that additional key information, including the full protocol, analysis plan and detailed results, is rapidly made publicly available.

Any information about a research undertaking or findings which is publicly available can be retrieved by mainstream and social media. These will spread the information further, but there are risks that the nature or significance of findings is misunderstood or overemphasized. Therefore, at least for those research projects that are likely to get media attention, it is highly recommended

that the communication plan includes details on how the research plans, conduct and findings will be communicated through the media, i.e. who will be responsible for this task (for instance the PI, assisted by the communication unit or officer if any); which mainstream and/or social media would be preferentially targeted; by which means the contents would be channelled, e.g. a dedicated website, press-releases, messages on social media etc.; and what amount must be made available under a dedicated budget line. As scientists are often not trained in communication, it is advisable to identify in the research team one or more trained spokesperson(s) responsible for communicating with the media.

E. Communication toward policy-makers in health systems

Policy-makers in health systems—including but not limited to ministries of health, national regulatory authorities, health insurances, reimbursement commissions, those drafting standard diagnostic and treatment guidelines etc.— significantly rely on research findings for translation into policies and practices. They make decisions that are relevant to recommendations on clinical care, health and social policies, or resource allocation, and ultimately for advancing individual and public health. Therefore, it is recommended that the communication plan includes details on how the research plans, challenges and findings will be practically communicated to relevant policy makers. This will include details on who will be responsible for this task; which relevant stakeholders would be engaged locally, nationally or internationally; by what means the communication will be channelled and discussions will be organised (such as through policy briefs, structured meetings, sharing of de-identified key information); and what amount should be available under a dedicated budget line.

26 — Institutional policies

All the above communication tasks will be easier to plan and implement at project level if framed into clearly-spelled out institutional policies and practices. These policies would ideally include (but not be limited to) the following components.

- Institutional endorsement of relevant methodological, ethical and integrity guidelines;
- Standard operating procedures or equivalent guidance for communication with research communities and with policy-makers in health systems;
- Training for junior staff, junior researchers, master and PhD students and others on research integrity (see Chapter 8. Education and learning);
- Researchers' evaluation criteria for publication that do not foster an ethos of "publish or perish"; and
- The establishment of a communication unit or appointment of a focal person to advise and support individual research projects.

Such an institutional framework will be useful to support researchers and research institutions when reactive communication is needed in case of crisis, e.g. in case of a safety incident during a clinical trial or in case of allegations of misconduct.

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CHAPTER 8.

EDUCATION AND LEARNING

Background and principles

The rapid advancement in health sciences has increased the complexity of research methods, the need of multidisciplinary research, and the stringency of ethical, regulatory, administrative and quality requirements worldwide, making health-related research more demanding. To fulfil their scientific and social purpose, research institutions increasingly need to ensure that their staff, as well as the staff of their collaborating partners, possess the qualifications, skills, experience and expertise needed to adequately and properly carry out their respective tasks in each research project. Effective governance of qualifications and learning of research personnel will help research institutions to uphold their research standards in terms of scientific/methodological soundness and ethical, regulatory and quality compliance at all stages of health-related research, from protocol development through project execution up to the dissemination of findings and translation into policies and practices. In addition, it may also bring extended benefits to the institutions and their research personnel by strengthening their reputation, facilitating future funding and research opportunities, and supporting their staff's career development.

Therefore, it is recommended that the following **resources** are carefully managed and monitored by the research institution in line with its institutional mandate and goals.

- **Learning opportunities:** Give all research staff access to adequate learning opportunities, based on their background and tasks, on a continuous basis.
- **Expertise and skills:** Put in place mechanisms to ensure that research staff have acquired the necessary expertise and skills to carry out their respective tasks in research projects, whether in research methods (e.g. clinical, epidemiological, qualitative or mixed-methods; good clinical/laboratory practices) or in research-related disciplines or activities (e.g. research ethics, research integrity, data management, scientific writing, planning, research contracts, administration).
- **Professional licenses:** Put in place mechanisms to ensure that where necessary, research staff have the appropriate professional licenses to practice in compliance with national laws and regulations.
- **Training/learning records:** Put in place mechanisms to document the training/learning activities and qualifications of all staff involved in research.

Appropriate qualifications and learning are important pre-conditions for the achievement of the research purposes. Within individual research projects, the principal investigators (PIs) have a particular responsibility for the overall conduct and supervision of their research projects. Thus, it is important that they check the skills and qualifications of the members of their research teams, and arrange any required training or re-training prior to the commencement of (and, if needed, during) the research project; and that they ensure proper documentation of all qualifications and learning activities.

It must be underlined that the responsibility of research institutions to ensure that all research staff are competent and skilled in conducting their tasks, is mirrored by research staff's responsibility to acquire and maintain such knowledge and skills. Therefore, anybody involved in performing, coordinating, managing or overseeing any research-related activities under a research institution—whether clinical researchers, epidemiologists, qualitative researchers, health economists, research coordinators, quality management officers, laboratory technicians, data managers, research administrators, legal experts, field data collectors, community health workers, translators or others —needs to acquire and maintain the relevant qualifications and knowledge in three **core domains**:

- **basic professional qualifications**;
- **research concepts and standards**; and
- **project-specific requirements**.

The above recommendations are obvious to institutions that carry out interventional clinical trials, because these are highly regulated and there are clear qualification and training requirements defined in the ICH GCP and other applicable guidelines and regulations. Nonetheless, a well-designed and structured approach to qualifications and training is also highly beneficial to institutions carrying out other health-related research, e.g. in the field of epidemiological, behavioural and health economic research. Irrespective of the research disciplines, proper governance of qualifications and training creates value for research institutions, research personnel, research participants and the public because it strengthens human participants' protection and ethical compliance; legal, regulatory and quality compliance; research quality and integrity; risk management; capacity building and research talents development; and advancement of research methods.

Points to consider and how to address them

27 — Basic professional qualifications

This refers to the fundamental professional qualifications that are required for an individual to carry out tasks in health-related research, e.g. medical doctors, nurses, pharmacists, dentists, dieticians, epidemiologists, biologists, toxicologists, psychologists, public health specialists, qualitative researchers, health economists, or legal experts. Research institutions need to ensure that all research staff, including but not limited to the PI, possess the necessary qualifications and continuous education to adequately and properly perform their research duties. In many

instances, this will also be checked by the research ethics committee when reviewing specific research proposals to ensure that the research team as a whole possesses a suitable mix of expertise for the purpose of the project.

It is generally recommended that the responsibility to verify the qualifications of staff should be attributed to the institution's management, for instance to the head of the department or unit concerned, preferably with support of the human resources department or unit.

28 — Research concepts, standards and skills

The core concepts, standards and skills in health-related research may be classified into six areas:

- research ethics and integrity (see Chapter 2. Ethics, law and scientific integrity);
- legal, regulatory and quality requirements (see Chapter 2. Ethics, law and scientific integrity);
- good research practice (see Chapter 3. Scientific standards);
- public perspectives on health-related research (see Chapter 7. Communication);
- research design and methodologies (see Chapter 3. Scientific standards and Chapter 4. Collection, storage, and use of data and/or biological materials in health-related research);
- research management and operations (see Chapter 1. Research institution management, Chapter 4. Collection, storage, and use of data and/or biological materials in health-related research, Chapter 5. Financial management and budgeting, Chapter 6. Collaboration, and Chapter 9. Institutional research oversight).

The relevance of each of the above for a specific institution depends on the categories of staff and its involvement in research.

It is recommended that research institutions cultivate a learning culture by encouraging and supporting research personnel to learn and keep themselves updated on the above concepts and standards. They can achieve this in practice by disseminating the latest regulations, guidelines and standards internally (e.g. via a website, Intranet or mailing lists) and/or by organizing in-house symposia, workshops, discussion groups, public engagement events, etc. (see Chapter 7. Communication), with the support of their research offices/units where applicable. Furthermore, the institution can encourage and support research personnel to participate in relevant external conferences, forums, symposia, training courses, etc.

29 — Project-specific requirements

The skills, expertise and qualifications needed to carry out specific tasks in a particular research project are set out in research protocols and related manuals or documents.

Ideally, a **qualification and learning plan** covering the required competencies for each role would be in place before the start of a research project, and no activity should start if the needed skills and expertise are not available, as checked by the PI or research coordinator. Research institutions should also oversee research duty delegation and training of research teams via their institutional research oversight mechanism (see Chapter 9. Institutional research oversight).

30 — Institutional governance of qualifications and learning

The domains of qualifications and learning outlined in Points 27–29 above will be easier to plan and implement at project level if they are framed into clearly-spelled out **institutional policies** for qualification and learning. Such institutional policies will also be helpful to cultivate a learning culture in a sustainable way over time, rather than depending solely on the inclination and motivation of individual learners.

These policies would ideally be produced and managed in collaboration with the human research department or unit, because providing ongoing professional updates (whether related or unrelated to research) is part of the tasks of the institution as responsible employer. Furthermore, it is recommended that the central or departmental administration is involved in these processes, given that ensuring adequate qualification and learning comes with costs, which need to be covered either at central or project level.

Table 7 on the next page summarizes the aforesaid domains, with some examples.

TABLE 7. Core domains of qualifications and learning for research personnel

Core domains	Research personnel responsibilities	Research institution responsibilities
Domain: Basic professional qualifications Scope: Professional qualifications; Continuous education		
Examples: ▪ Diploma/master in epidemiology ▪ Diploma/master in anthropology ▪ Licence to exert the medical, nursing or allied health profession ▪ Diploma/master in administration ▪ Diploma/master in health economy	▪ (Upfront) Acquire the necessary professional qualifications ▪ (Ongoing) Continuous education	▪ Ensure research personnel possess the necessary qualifications ▪ Support continuous education ▪ Document the qualifications
Domain: Research concepts, standards & skills Scope: Research ethics; Legal, regulatory and quality requirements; Good research practice; Public perspectives on health-related research; Research designs and methodologies; Research management and operations.		
Examples: ▪ Master/certificate in research ethics ▪ Certificate in good clinical practice (GCP) ▪ Certificate in data management ▪ Master/certificate in qualitative or mixed methods ▪ Master/certificate in pharmacoepidemiology and pharmacovigilance ▪ Training in research integrity ▪ Training in data protection ▪ Training in research designs, methodologies, report writing and publication ▪ Training on CIOMS guidelines ▪ Training on CONSORT, STROBE, or other methodological guidelines ▪ Training on SAGER guidelines ▪ Training in research project management	▪ Learn relevant research concepts and standards via self-learning and/or participating in learning events	▪ Ensure research personnel possess the necessary skills ▪ Support training ▪ Document training ▪ Cultivate a learning culture ▪ Disseminate latest regulations/ guidelines/standards ▪ Support participation in learning events
Domain: Project-specific requirements Scope: Project objectives, practices, procedures and requirements		
Examples: ▪ Training in specific data management tools (e.g. REDCap for quantitative research, NVivo for qualitative research) ▪ Training in the study standard operating procedures ▪ Training in national research guidelines (research host country) ▪ (Re)training in research ethics ▪ (Re)training in good clinical practice (GCP) ▪ Training in external or internal quality control	▪ Principal investigator (PI): Ensure team members are adequately (re)trained, and document the training ▪ Research team members: learning research protocol and related requirements	▪ Ensure research personnel have been adequately (re)trained ▪ Document the training

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* The draft third revision of the ICH Harmonised Guideline on Good Clinical Practice (GCP), E6(R3), was under public consultation at the time of writing this document.

CHAPTER 9.

INSTITUTIONAL RESEARCH OVERSIGHT

Background and principles

Research institutions are accountable to the public. They therefore have the responsibility to oversee their research practices and activities to ensure that good value is generated for the society whilst risks are justified. Institutional research oversight refers to the system, methods and processes of overseeing an institution's research infrastructure, personnel, mechanisms and projects in a proactive manner. Research oversight is an integral part of good research practice and helps to:

- ensure ethical research conduct and participants' protection;
- uphold research data quality and integrity;
- achieve compliance with applicable national/international guidelines, standards and regulations;
- use limited research resources effectively and limit research waste; and
- execute projects in accordance with project time plans and budgets.

The term "oversight" is used here deliberately to avoid confusion with the "monitoring" obligation of sponsors in for drug trials according to the ICH good clinical practice (GCP) guidelines and national laws and regulations. The nature and level of scrutiny of institutional research oversight depend on the nature and level of research activities carried out within—or in collaboration with—the institutions concerned. Even when institutions act as sponsors of research projects, it may be neither necessary nor desirable that they follow the ICH GCP model for their oversight activities outside the field of drug trials.

Research oversight can be organized and executed in the following two dimensions.

- **System oversight:** overseeing the research capabilities and capacity of the research institution to make sure that researchers and research personnel are qualified and competent, come from diverse backgrounds representative of local communities and are gender-balanced; that required facilities, equipment and tools are in place and maintained in good order; and that appropriate policies and procedures are established and executed to guide the proper conduct of research activities in compliance with the applicable ethical, regulatory and quality requirements.
- **Project oversight:** overseeing the setup and operation of a research project to ensure that the rights, safety and well-being of participants are protected, the project is progressing

according to the time plan, funding is spent within the budget, and data are collected, documented, analyzed, reported and publicly disclosed/published properly.

Institutional research oversight upholds the scientific robustness of the methods employed in study conduct, the protection of the rights, safety and well-being of human participants, research integrity, and the quality of the research outcomes. Ongoing research oversight plays an important role in preventing, detecting and stopping unethical practices, research waste, fraud or falsification in the conduct of research, protocol violations, and plagiarism in reporting.

Points to consider and how to address them

31 — Methods of research oversight

A research institution has the primary responsibility to:

- establish an internal research oversight system – for the institution itself and for its researchers and research teams; and
- set out practical policies and guidance to support external research oversight by relevant external stakeholders.

Depending on the statutes of a research institution and the nature of its research projects, different methods of internal and external oversight may be applied at different levels (Table 8). For clarification, a research institution does not necessarily have to use all these methods but may select a combination of methods that serves its own purposes, considering factors such as the institution's research objectives, the risks of its research projects, its regulatory environment, and the expectations of its communities.

TABLE 8. Overview of research oversight methods and levels

Level	Methods: Internal research oversight	Methods: External research oversight
1	**Self-checking by research team** First line project and quality control measure for a research project *Target*: to discover, rectify and minimize deviations from the study protocol, applicable standards and project time/budget plans	**Monitoring by sponsor** Primary project and quality control measure for a sponsor's project team *Target*: to discover and rectify deviations from the study protocol and applicable standards and oversee project progress in alignment with project time/budget plans
2	**Central oversight by institutional office/unit** Institutional governance *Target*: to oversee research compliance, resources utilization and project progress on system and project levels	**Auditing by sponsor / funding body / collaborator** Organizational oversight by sponsor/funding body/collaborator *Target*: to oversee research compliance, resources utilization and project progress
3	**Ethical oversight by institutional REC (if applicable)** Representing institutional research ethics governance *Target:* to oversee research ethics and regulatory compliance and participant protection	**Inspection by external REC / accreditation body / regulatory agency** Research ethics and regulatory oversight *Target*: oversee ethics, regulatory and quality compliance and data integrity for research institutions and/or their research projects

REC: Research ethics committee

32 — Internal research oversight

Whilst establishing an internal research oversight system is the responsibility of a research institution, execution of internal research oversight is the joint responsibility of all research stakeholders within the institution, including institutional management, researchers/research personnel and other delegated units/persons. Table 9 provides an outline of an internal research oversight system.

TABLE 9. Outline of an internal research oversight system

Primary responsibility	Possible delegate	Methodology & scope	Institution's role
Level 1: Self-checking by research team			
Researcher	Study coordinator, research assistant	▪ Full checking ▪ Targeted checking	▪ Developing guidance documents and forms for use by researchers and research teams ▪ Establishing and operating a mechanism for advising and receiving reports from researchers
Level 2: Central oversight by institutional office/unit			
Research oversight committee, central research office, quality management department, or equivalent	Internal quality specialist, contracted auditor	▪ System oversight: Routine or for-cause review ▪ Project oversight: All projects or selected projects	▪ Delegating an institutional office/unit to perform central oversight ▪ Establishing a mechanism to select units/teams/ projects for checking ▪ Developing guidance documents and forms for system oversight and project oversight
Level 3: Ethical and regulatory oversight by institutional REC (if applicable)			
Institutional REC	Institutional REC member, contracted auditor	▪ System oversight ▪ Project oversight	▪ Authorizing the institutional REC to perform ethical and regulatory oversight ▪ Receiving feedback/reports from institutional REC ▪ Procuring relevant researchers and institutional offices/units to respond to institutional REC's feedback

REC: Research ethics committee

Level 1 oversight (self-checking): Researchers play an important role in conceiving, designing, conducting and reporting research, and also assume the primary responsibility for ensuring compliance and quality of their research projects. They should therefore maintain adequate and verifiable research records and delegate team member(s) to perform first-line checking of their research works. Depending on a project's nature, risks and applicable ethical, regulatory and quality requirements, self-checking can be performed by way of:

- **Full checking:** reconstructing and verifying the entire research process against the research protocol and applicable standards by checking all research-related records and data,

including but not limited to source documents, clinical notes, case report forms, participant-administered questionnaires, researcher training records and equipment maintenance records; or

- **Targeted checking:** checking of only pre-defined important records and process (e.g. informed consent documents, data supporting the primary objective of the project)—usually by applying a risk-based approach—to ensure that the key research data are reliable and the most important requirements and conditions are fulfilled.

Research institutions should provide guidance and support to researchers and their research teams on performing self-checking of their projects. Issuance of guidelines and checking tools (e.g. checklists, reporting forms) and organization of training are valuable options.

Level 2 oversight (institutional / central): Research institutions are responsible for maintaining a research-friendly environment that helps researchers and research personnel to adopt good research practice and undertake research with good compliance and integrity. The more research activities an institution has, the greater is the need for a central oversight system operated by a delegated research oversight committee, central research office, quality management department, or equivalent unit. Central research oversight can be performed from the dimension of system oversight or project oversight, as described in the Background and principles section above.

For sizeable research institutions with multiple layers/units, system review can be performed regularly as a routine exercise, and may be done for individual departments/units/specialties in turn, rather than for the entire institution in one go. Additional reviews can be organized as needed, for instance in case of any concern or complaint.

For smooth execution of project review, institutions may establish a review plan with pre-defined check-points for each research project. In case an institution is running a large number of ongoing projects, it may not be practically feasible to review every single project. In this regard, the institution may establish a mechanism for selecting a manageable number of projects for review within each defined period (e.g. annually). Again, a risk-based approach taking into consideration certain core risk factors (e.g. involvement of vulnerable participants, enrolment of a large number of participants, and application of investigational interventions) is recommended.

Level 3 oversight (ethical and regulatory): Some research institutions may establish and operate their own institutional RECs to oversee research ethics and regulatory matters, and these may undertake a more independent role in performing another level of research oversight, in particular with focus on protecting the rights, safety and well-being of research participants and their affiliated communities. Like central research oversight (described above), ethical and regulatory oversight can be performed from the dimension of systems or projects. To facilitate this, research institutions should give their institutional RECs due authority, and establish a mechanism to require relevant researchers and institutional offices/units to cooperate with the institutional RECs and respond to their feedback.

33 — External research oversight

Health-related research is more and more organized in a collaborative manner, with the aim of generating better value for benefiting a wider population. Research projects are therefore more often subject to external oversight by collaborating parties, whether commercial sponsors, other collaborating institutions, funding bodies, accreditation bodies or regulatory agencies.

Different external bodies may have different oversight requirements, depending on their roles and involvement in the corresponding research projects or activities. For instance, commercial sponsors may have their focus on protocol compliance, while funding bodies may pay more attention to resource utilization and budget control.

Although research institutions have a relatively passive role in terms of external research oversight, they should establish appropriate institutional policies and guidance for researchers and relevant institutional offices/units in **facilitating external oversight activities**, in particular with regard to:

- **Personnel records maintenance:** maintaining and retaining updated CVs, qualification certificates and training records for researchers and research personnel;
- **Facility and equipment maintenance:** maintaining and retaining corrective/preventive maintenance and calibration records for relevant research facilities and equipment;
- **Research documents and records maintenance:** generating and retaining all essential research records such as informed consent documents, source records, case report forms and survey forms—whether in paper, electronic or other formats—during the period of each project and the required duration after project closure.

Proper document retention is a key prerequisite for supporting external oversight. However, long-term document retention is a common challenge for researchers. Research institutions are advised to allocate/identify sufficient document storage space (within or outside the institution) and establish a research document management mechanism to facilitate long-term document archiving and document retrieval as needed.

Research institutions should also recognize the merit of the people who contribute to the functioning of RECs, compatible with the honorary nature of their position. In view of the heavy workload it involves, employees who are members of RECs should be allocated sufficient time for their duties, and their involvement should be encouraged and facilitated.

34 — Continuous improvement

Institutional research oversight is not a one-time exercise. In addition to the subject matter of each review, it is important for encouraging the institution's continuous improvement. It is therefore necessary to incorporate a positive feedback loop in the research oversight systems to enable:

- documentation of identified observations/findings;
- reporting of identified observations/findings to researchers and institutional offices/units;
- escalation of identified observations/findings to institutional management;
- evaluation of the root causes of identified observations/findings; and

- implementation of corrective and/or preventive actions (after approval by the relevant RECs/regulatory authorities, if applicable) to attain institutional improvement in terms of research capabilities, quality and compliance.

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* The draft third revision of the ICH Harmonised Guideline on Good Clinical Practice (GCP), E6(R3), was under public consultation at the time of writing this document.

ANNEX 1.

OVERVIEW OF POINTS TO CONSIDER IN ESTABLISHING GOOD GOVERNANCE PRACTICE FOR RESEARCH INSTITUTIONS

CHAPTER 1. RESEARCH INSTITUTION MANAGEMENT

1 — Research scope, mission, vision and values
2 — Organizational structure, leadership and culture
3 — Knowledge management, quality management and risk management
4 — Communication with stakeholders

CHAPTER 2. ETHICS, LAW AND SCIENTIFIC INTEGRITY

5 — Responsibilities towards research participants
6 — Responsibilities towards researchers and research team members
7 — Institutional culture to enhance working with scientific integrity
8 — Accountability, transparency and participation

CHAPTER 3. SCIENTIFIC STANDARDS

9 — Awareness and coordination of proposed and ongoing research
10 — Scientific value and appropriate research plan
11 — Scientific rigour—review and training

(continued)

Annex 1 (continued)

CHAPTER 4. COLLECTION, STORAGE, AND USE OF DATA AND/OR BIOLOGICAL MATERIALS IN HEALTH-RELATED RESEARCH

12 — Responsibilities towards the participants
13 — Access and transfer of data and biological materials
14 — Biobanking & databanking
15 — Operational requirements for the collection, storage and use of data and biological materials
16 — Data lifecycle

CHAPTER 5. FINANCIAL MANAGEMENT AND BUDGETING

17 — Institutional resource planning
18 — Project budgeting
19 — Financial administration
20 — Financial compliance

CHAPTER 6. COLLABORATION

21 — Identifying suitable collaborators
22 — Collaboration plan and concerted execution
23 — Collaboration agreements

CHAPTER 7. COMMUNICATION

24 — Internal communication
25 — External communication
26 — Institutional policies

CHAPTER 8. EDUCATION AND LEARNING

27 — Basic professional qualifications
28 — Research concepts, standards and skills
29 — Project-specific requirements
30 — Institutional governance of qualifications and learning

CHAPTER 9. INSTITUTIONAL RESEARCH OVERSIGHT

31 — Methods of research oversight
32 — Internal research oversight
33 — External research oversight
34 — Continuous improvement

ANNEX 2.

CIOMS WORKING GROUP MEMBERSHIP AND MEETINGS

The CIOMS Working Group on Good Governance Practice for Research Institutions met in a series of eight meetings from July 2021 to September 2023. The Working Group report was reviewed in draft form by participating members and was finalized by an editorial team. The members of the editorial team were: Anant Bhan, Johannes van Delden, Ames Dhai, Marie Hirtle and Raffaella Ravinetto, supported by Dominique Sprumont and Monika Zweygarth.

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CIOMS Working Group meetings

Meeting	Date	Venue
1	7 July 2021	Virtual
2	6 October 2021	Virtual
3	11 February 2022	Virtual
4	22 August 2022	Virtual
5	10–12 November 2022	Geneva, Switzerland
6	6 February 2023	Virtual
7	27 March 2023	Virtual
8	31 August–1 September	University of Neuchâtel, Switzerland

ANNEX 3.

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Scientific research is essential to protect and improve the health and well-being of people around the world. Researchers are also at the front line to respond to health emergencies. In recent years, the scientific community has been bearing heavy responsibilities to face some unprecedented challenges.

Since the 1960s, numerous ethical, professional and industrial guiding documents have been adopted to facilitate and contain the increasingly complex research activities conducted with human participants globally. Many of these guidelines focus on individual researchers' responsibilities to protect research participants while conducting good quality scientific studies. In practice, however, it is rarely assessed to what extent researchers are given the necessary resources for this purpose at their institutions. These guidelines review the existing standards and best practices in the field, and offer research institutions detailed and specific guidance on how to implement them.

International guidelines on good governance practice for research institutions. Geneva: Council for International Organizations of Medical Sciences (CIOMS), 2023.

This publication is freely available on the CIOMS website.

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ISBN 978-92-9036-104-6