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2 Glossary

The glossary defines concepts used in this documents and also contains definitions from the General Data Protection Regulation 2016/679 relevant for HBM4EU

Concept	Definition	GDPR, ¹ Article, No.
Aggregated Data	Aggregated data merge information of multiple patients or survey participants and the collected information cannot be retraced to the individual data. Aggregated data are used in ecological studies and when analysing differences between countries or other population groups.	
Anonymized data	Measurement data for which re-identification of data subjects is completely impossible. All possible de-identification keys have been destroyed; de-identification is not possible by combining variables or by matching with any other data	
Assent	Informed assent describes the process whereby minors may agree to participate in clinical trials.	
Biobank	A biobank is a collection of biological samples such as blood, urine and other tissues, often complemented with related information such as socio-economic position, diagnosed diseases etc. Biological samples stored in biobanks can be used in biomedical research and retrospective laboratory analysis to determine new biomarkers. Many countries in Europe have biobanks. These biobanks can be specific for one study or hospital, or organization of joint biobanks for several instances. At the EU level, the European Research Infrastructure Consortium on Biobanking and BioMolecular Resources Infrastructure (BBMRI-ERIC) ² has been established to facilitate European level collaboration between biobanks.	
Biometric data, definition according to GDPR	Personal data resulting from specific technical processing relating to the physical, physiological or behavioural characteristics of a natural person, which allow or confirm the unique identification of that natural person.	Article 4 (14)
Consent, definition according to GDPR	'consent' of the data subject means any freely given, specific, informed and unambiguous indication of the data subject's wishes by which he or she, by a statement or by a clear affirmative action, signifies agreement to the processing of personal data relating to him or her	Article 4 (11)
Consortium partners	As specified in the HBM4EU Grant Agreement (Grant Agreement number: 733032 — HBM4EU — H2020-SC1-2016-2017/H2020-SC1-2016-RTD).	

¹ REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2016.119.01.0001.01.ENG

² <http://www.bbMRI-eric.eu/bbMRI-eric/>

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Data Controller, definition according to GDPR	The natural or legal person, public authority, agency or other body which, alone or jointly with others, determines the purposes and means of the processing of personal data; where the purposes and means of such processing are determined by Union or Member State law, the controller or the specific criteria for its nomination may be provided for by Union or Member State law.	Article 4 (7)
Data concerning health, definition according to GDPR	Personal data related to the physical or mental health of a natural person, including the provision of health care services, which reveal information about his or her health status.	Article 4 (15)
Data generated with HBM4EU co-fund	Collection of (part of) the data has been (partly) funded under grant agreement number 733032 — HBM4EU — H2020-SC1-2016-2017/H2020-SC1-2016-RTD. This includes fieldwork and laboratory analysis.	
Data not generated with HBM4EU co-fund	No funding from Grant Agreement number 733032 — HBM4EU — H2020-SC1-2016-2017/H2020-SC1-2016-RTD has been used to collect the data, including field work and laboratory analysis.	
Data management Plan (DMP)	See Deliverable 10.1 of the HBM4EU project	
Data Owner	The entity that holds the legal ownership of data, and as such can authorize or deny access to data.	
Data Processor, definition according to GDPR	A natural or legal person, public authority, agency or other body which processes personal data on behalf of the controller	Article 4 (8)
Data Provider	The entity (nominated by the Data Owner) in charge of the collection, acquisition, production, management, quality control and/or publication and dissemination of data.	
Data Subject	A Data Subject (in GDPR-context) is a natural person, whose personal data is collected, stored and processed by a data controller and/or a data processor	
Ethics	<p>Ethics is an integral part of research from the beginning to the end. The most common ethical issues include:</p> <ul style="list-style-type: none"> • the involvement of children, patients, vulnerable populations, • the use of human embryonic stem cells, • privacy and data protection issues, • research on animals and non-human primates. 	
Filing system, according to GDPR-definition	*filing system* means any structured set of personal data which are accessible according to specific criteria, whether centralised, decentralised or dispersed on a functional or geographical basis.	Article 4 (6)
Genetic data, definition according to GDPR	Personal data relating to the inherited or acquired genetic characteristics of a natural person which give unique information about the physiology or the health of that natural person and	Article 4 (13)

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	which result, in particular, from an analysis of a biological sample from the natural person in question.	
Genetic screening	<p>A search in a population to identify individuals who may have, or be susceptible to, a serious genetic disease, or who, though not at risk themselves, as gene carriers may be at risk of having children with that genetic disease.</p> <p>May involve testing members of a population (or sub-population) for a defect or condition, usually where there is no prior evidence of its presence in individuals or their relatives, and as part of a public health service. For example, all parents in the UK are offered screening for phenylketonuria (PKU) for their new-born children. Alternatively, the offer of screening may be limited to a sub-population that is at particular risk of a genetic condition. For example, Ashkenazi Jews may decide to be screened to find out if they are carriers of Tay-Sachs disease.</p>	
Genetic testing	Usually involves testing an individual for the genetic change mutation underlying a condition or abnormality that may be suggested by other evidence. Often, he or she would have sought advice from a medical practitioner. For example, individuals may be tested for the genetic mutation that causes Huntington's disease if they are known to be at high risk of developing the disorder because a member of their family is affected, or if they have symptoms ³ .	
Individual data	Individual level data comprise health and HBM information of a single patient or survey participant concerning his/her name, age, sex, HBM data, diagnosis, medical history and other relevant information. If it is envisaged to record the course of the disease of a patient over time, it is necessary to collect individual data. This is also true if you want to communicate the results to each person. Ethical and legal issues of data collection are crucial when working with individual level data.	
Informed consent	Is an informed decision to participate in research, taken by a competent individual who has received the necessary information; who has adequately understood the information; and who, after considering the information, has arrived at a decision without having been subjected to coercion, undue influence or inducement, or intimidation ⁴ .	
Intellectual property right (IPR)	Covered in Article 23a of the Grant Agreement and developed in the publication policy.	
International organisation,	An organisation and its subordinate bodies governed by public international law, or any other body which is set up by, or on the basis of, an agreement between two or more countries.	Article 4 (26)

³ <https://nuffieldbioethics.org/wp-content/uploads/2014/07/Genetic-Screening-a-Supplement-to-the-1993-Report-2006.pdf>

⁴ WHO Standards and Operational Guidance for Ethics Review of Health-Related Research with Human Participants 2011

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definition according to GDPR		
Personal data, definition according to GDPR	Any information relating to an identified or identifiable natural person ('data subject'); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.	Article 4 (1)
Personal data breach, definition according to GDPR	A breach of security leading to the accidental or unlawful destruction, loss, alteration, unauthorised disclosure of, or access to, personal data transmitted, stored or otherwise processed.	Article 4 (12)
Privacy	The state or condition of being alone, undisturbed, or free from public attention, as a matter of choice or right; seclusion; freedom from interference or intrusion; absence or avoidance of publicity or display; secrecy, concealment, discretion; protection from public knowledge or availability.	
Processing, definition according to GDPR	Any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction.	Article 4 (2)
Profiling, definition according to GDPR	Any form of automated processing of personal data consisting of the use of personal data to evaluate certain personal aspects relating to a natural person, in particular to analyse or predict aspects concerning that natural person's performance at work, economic situation, health, personal preferences, interests, reliability, behaviour, location or movements.	Article 4 (4)
Project Coordinator, HBM4EU	German Environment Agency - UBA, as specified in the HBM4EU Grant Agreement (Number: 733032 — HBM4EU — H2020-SC1-2016-2017/H2020-SC1-2016-RTD)	
Pseudonymisation	The processing of personal data in such a manner that the personal data can no longer be attributed to a specific data subject without the use of additional information, provided that such additional information is kept separately and is subject to technical and organisational measures to ensure that the personal data are not attributed to an identified or identifiable natural person.	Article 4 (5)
Pseudonymised data	Single measurement data for which indirect re-identification of data subjects is possible. The dataset does not contain directly identifiable variables such as personal identification, name and address. In combination with an identification key (available only by the data controller), by combining variables in the dataset, or	

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	by combining the dataset with any other data, re-identification of study subjects is possible.	
Recipient, definition according to GDPR	A natural or legal person, public authority, agency or another body, to which the personal data are disclosed, whether a third party or not. However, public authorities which may receive personal data in the framework of a particular inquiry in accordance with Union or Member State law shall not be regarded as recipients; the processing of those data by those public authorities shall be in compliance with the applicable data protection rules according to the purposes of the processing.	Article 4 (9)
Relevant and reasoned objection, definition according to GDPR	An objection to a draft decision as to whether there is an infringement of the GDPR Regulation, or whether envisaged action in relation (the GDPR Regulation), which clearly demonstrates the significance of the risks posed by the draft decision as regards the fundamental rights and freedoms of data subjects and, where applicable, the free flow of personal data within the Union.	Article 4 (24)
Representative, definition according to GDPR	A natural or legal person established in the Union who, designated by the controller or processor in writing pursuant to Article 27, represents the controller or processor with regard to their respective obligations under this Regulation.	Article 4 (17)
Restriction of processing, definition according to GDPR	The marking of stored personal data with the aim of limiting their processing in the future	Article 4 (3)
Third party, definition according to GDPR	A natural or legal person, public authority, agency or body other than the data subject, controller, processor and persons who, under the direct authority of the controller or processor, are authorised to process personal data.	Article 4 (10)
Voluntary	Performed or done of one's own free will, impulse, or choice; not constrained, prompted, or suggested by another; (2) free of coercion, duress, or undue inducement. Used in the health and disability care and research contexts to refer to a consumer's or participant's decision to receive health or disability care or to participate (or continue to participate) in a research activity.	
Vulnerable (research) participants	<p>Vulnerable persons are those who are relatively (or absolutely) incapable of protecting their own interests. More formally, they may have insufficient power, intelligence, education, resources, strength, or other needed attributes to protect their own interests. Individuals whose willingness to volunteer in a research study may be unduly influenced by the expectation, whether justified or not, of benefits associated with participation, or of a retaliatory response from senior members of a hierarchy in case of refusal to participate may also be considered vulnerable.</p> <p>Examples are members of a group with a hierarchical structure, such as medical, pharmacy, dental, and nursing students,</p>	

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	<p>subordinate hospital and laboratory personnel, employees of the pharmaceutical industry, members of the armed forces, and persons kept in detention. Other vulnerable persons include patients with incurable diseases, people in nursing homes, unemployed or impoverished people, patients in emergency situations, ethnic minority groups, homeless people, nomads, refugees, minors, and those incapable of giving consent for example due to cognitive limitations. This list may not be exhaustive as there may be circumstances in which other groups are considered vulnerable, women for example, in an orthodox patriarchal society.</p>	
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3 List of Abbreviations

ABS	EU regulation on Access and Benefit Sharing
AWP	Annual Work Plan
CA	Consortium Agreement
CB	Cord Blood
CIOMS	Council of International Organisations of Medical Sciences
CRC	United Nations Convention of the Rights of the Child
DEMOCOPHES	DEMONstration of a study to COordinate and Perform Human biomonitoring on a European Scale ran from September 2010 to November 2011
DH	Public Health England, UK
DMP	Data Management Plan
DPA	Data Protection Assessor
DPIA	Data Protection Impact Assessment
DPO	Data Protection Officer
DoA	Description of Action: Annex 1 of the Grant Agreement
DTA	Data Transfer Agreement
EB	Ethics Board
EC	European Commission
ECHA	European Chemicals Agency
EEA	European Environment Agency
EGE	European Group on Ethics in Science and New Technologies
EU	European Union
HBGRD	Human Biobanks and Genetic Research Databases
GDPR	General Data Protection Regulation
HBM	Human biomonitoring
HBM4EU	Human biomonitoring for Europe
IAPP	International Association of Privacy Professionals
ICOH	International Commission on Occupational Health
IPChem	Information Platform for Chemical Monitoring
IPR	Intellectual Property Rights
JRC	Joint Research Centre
LTP	Linked Third Party
MCC	Model Contract Clauses
MTA	Material Transfer Agreement
NIS	Network Information System
NGO	Non-governmental organisation
NRCWE	National Research Center for the Working Environment, Denmark
NHCP	National Hub Contact Point
PC	Project Coordinator
PcC	Project Co-Coordinator
PL	Pillar leader
PIA	Privacy Impact Assessment

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RUMC	Radboud University Medical Centre, Nijmegen, The Netherlands
SES	Socioeconomic status
THL	National Institute for Health and Welfare, Finland
UBA	UmweltBundesAmt, Coordinator, Germany
UCPH	University of Copenhagen
VITO	Vision on Technology, Belgium
WMA	World Medical Association
WPL	Work Package Leader

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4 Abstract/Summary

The HBM4EU project aims at the coordination and harmonization of existing HBM (human biomonitoring) initiatives in 28 countries.

Existing data and samples from these initiatives are expected to be made available for research within HBM4EU, to the extent possible. For new HBM data and data generated during the project with HBM4EU co-fund, it will be mandatory to allow use of data as individual level measurement data to meet the objectives of the HBM4EU project. This obligation and the objectives are defined in the Grant Agreement (Description of Action).

HBM4EU will operate with a legal and ethical model that make data and samples available through lawful means, such as informed consent. Other lawful means for the collection, storing and use of data and the collection, storing, transfer and use of biological samples for research purposes will also be included in the HBM4EU. According to the HBM4EU legal and ethical model, partners will seek ethics and data management approvals by local authorities and ensure compliance with national, EU and international legislation.

This document, referred to as the HBM4EU legal and ethics policy, applies to the research conducted during the course of HBM4EU in all pillars and work packages of the project in which biological samples and data on human subjects are involved. This includes, but is not limited to, exposure data, health data, biometric data, and molecular data. The only purpose of access and use of the data on human subjects and data from animals is to meet the objectives of the HBM4EU project, as described in the Grant Agreement.

The procedures described in the HBM4EU legal and ethics policy document ensures that personal data on human subjects are processed (particularly collected, handled, transferred and analysed) in a secure setting, for defined purposes and not further processed for incompatible purposes, and are not kept for a longer period than is necessary for the purposes of the processing.

The procedure furthermore ensures that processing of the data is compliant with all national and EU level ethics and legal considerations, in particular the new General Data Protection Regulation (GDPR)⁵.

As part of the evaluation procedures of the HBM4EU proposals an ethics review was performed by the Commission resulting in a list of ethics requirements to be addressed by the project (see Annex 3). As the HBM4EU Grant Agreement implies Annual Work Plans (AWP) and accompanying ethics reports (ER) in M9, 21, 33 and 45, these requirements must be addressed in the annual ethics report accompanying the Annual Work Plans.

An Excel template to support submission of required documents and information has been prepared (<https://www.hbm4eu.eu/about-hbm4eu/ethics/>, see also Annex 1).

A separate deliverable with Data Management Plan (D10.1) has been provided for the transfer of data into IPCheM. The attachment to the Deliverable Report D10.1 gives the necessary documents to be used for data transfer.

A procedure has been established for uploading of all relevant national documents in a central database by the coordinator in cooperation with WP10/VITO. The partners contributing are responsible for timely and adequate provision of documents (summarized in English), and an overview of all

⁵ REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)
https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2016.119.01.0001.01.ENG

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uploaded documents per country and cohort will be made available on the internal HBM4EU websites under WP1.

HBM4EU follows the EU Regulation on Access and Benefit Sharing (ABS)⁶. In relation to genetic resources and the fair and equitable sharing of benefits arising from their utilization, each partner has to consider the involvement of genetic resources or traditional knowledge associated with genetic resources. Exercising due diligence is the core obligation under the ABS regulation.

⁶ Regulation (EU) No 511/2014 of the European Parliament and of the Council of 16 April 2014 on compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the Union <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014R0511>

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5 Objectives of the HBM4EU Legal and Ethics Policy Document

The objectives of this policy paper are to comply with 'Article 34 ETHICS' of the Grant Agreement, and to align all ethics and data protection issues within the HBM4EU project to ensure full compliance with all EU and national legal aspects.

Taking into account the application of the GDPR (General Data Protection Regulation) by May 25, 2018, another objective of this Policy Paper will be to monitor and take-up the coming development of practice and guidelines in the area of research, especially the guidelines from Article 29 GDPR.

The target group of this document are all partners of the HBM4EU consortium and the purpose is to alert the partners to their ethics obligations.

Intellectual property right (IPR) issues are covered in 'Article 23a — MANAGEMENT OF INTELLECTUAL PROPERTY' of the Grant Agreement.

How to read the Policy Paper

This policy paper consists of chapters giving an overview of the specific issues of ethics and law for HBM4EU, namely the bioethics and bio-law principles laying out the cornerstones of the bioethical basis for conducting research involving human biomonitoring and the data ethics and data-law principles in the EU-regulation on General Data Protection Regulation (GDPR) serving as foundation for data-protection and safeguarding the privacy and confidentiality of the research participants. The conventional overarching ethical principles of bioethics, i.a. the principles of Autonomy, Beneficence, Nonmaleficence and Justice, serve as levers in balancing the human- and bioethics-rights of the research participants with the societal need for advancements in research. The bioethics' concept of informed consent serves as safeguard for the conventional bioethics principles, and is described in chapter 6. The concept of consent in relation to data protection (GDPR) serves as safeguard for the dataethics principles and is described in chapter 9.

Furthermore, the policy paper describes specific issues of ethical concern in the HBM4EU project and states recommendations for HBM-research in these areas: Genetic testing (chapter 11), Psychological or socio-economic information (chapter 12), Vulnerable groups, Children and young persons and research in cord blood/placenta (chapter 13), Occupational health studies (chapter 14). The recommendations of the policy-paper are comprised in chapter 16 along with references to the chapters dealing with the different topics.

The annexes consist of examples of forms and excel sheets for reporting ethics in HBM4EU and specific recommendations for special types of research in HBM4EU.

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6 Conventional Bioethics Principles

"Conventional bioethical principles," have gained wide use for evaluating policies, programs or activities that may entail risk to human health. The reason for this is that these principles "work" in the real world. The four major ethical principles in bioethics are viewed as duties that many contemporary philosophers believe to be *prima facie*. *Prima facie* duties take precedence over any other considerations except another duty. The "big four" are ⁷

- "Autonomy," also known as the "respect for humans" principle, acknowledges the belief that an individual understands his or her own best interests better than anyone else;
- "Beneficence" means to "do good" for people; all stake holders are to be considered;
- "Nonmaleficence," sometimes seen as a corollary to beneficence, means to "do no harm" to people;
- "Justice" captures the belief that there should be a fair distribution of the benefits and costs (including risks to health) of an activity or program.

Beauchamp and Walters list four additional bioethical principles, which they refer to as "secondary principles"⁸:

- "Utility" describes the idea that actions should achieve the most good for the greatest number of people;
- "Fidelity" means that decisions regarding controversies should demonstrate consistency with other similar cases;
- "Veracity" holds that decisions or policies should neither ignore established truths nor try to state beliefs as such;
- "Confidentiality" is the idea that an individual's right to privacy should be protected.

The one that most often comes into ethics discussions is veracity. A normative process cannot proceed in the face of disingenuous interpretations of scientific knowledge and other established truths.

The traditional bioethical principles – autonomy, beneficence, non-maleficence, and justice – have been criticised for overemphasizing individual rights and failing to incorporate contextual factors and relationships embedded in the family and the community (Flicker et al. 2007⁹; Quigley 2012¹⁰). For instance, informed consent protocols are predominantly perceived as static and discrete events for individuals who must be informed about research benefits and risks in order to make autonomous decisions (Barata et al. 2006¹¹). The significant role of communal or familial gatekeepers and of cultural norms in the decision-making process are thereby often ignored. However, research participants are always drawn from wider communities, so risks, harms and benefits may potentially be generated that resonate beyond the individual (Marsh et al. 2011¹²). This focus on individual research protection has left some social groups and communities vulnerable to (unintended) negative consequences of research participation such as data abuse that will discredit or stigmatize

⁷ Harrison, M: Applying bioethical principles to human biomonitoring Environmental Health 2008 7(Suppl 1):S8

⁸ Beauchamp T, Walters L, (Eds): Contemporary Issues in Bioethics. 1994, Belmont, California: Wadsworth Publishing Company

⁹ Barata, P.C., Gucciardi E., Ahmad F., Stewart D.E., *Cross-cultural perspectives on research participation and informed consent. Social Science & Medicine*, 2006. 62(2): p. 479-490.

¹⁰ Quigley D, Applying Bioethical Principles to Place-Based Communities and Cultural Group Protections: The Case of Biomonitoring Results Communication, *Journal of Law, Medicine & Ethics*, 2012: 348-358.

¹¹ Barata, P.C., Gucciardi E., Ahmad F., Stewart D.E., *Cross-cultural perspectives on research participation and informed consent. Social Science & Medicine*, 2006. 62(2): p. 479-490

¹² Marsh V.M., Kamuya D.K., Parker M.J., Molyneux C.S., Working with Concepts: The Role of Community in International Collaborative, Biomedical Research. *Public Health Ethics*, 2011: 4(1):26-39

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the community or decreasing neighbourhood's property values due to disclosure of research data (Flicker et al. 2007; Cordner et al. 2012¹³). They are often the result of practices called “parachute” or “helicopter” research (Covello and Zumla 2000¹⁴) – dropping into a community to extract data and then leave without providing information.

Guidelines to counter these pitfalls are found in concepts of “reflexive research ethics” (Cordner et al. 2012) or “community-based research ethics” (Morello-Frosch et al. 2009¹⁵) in which collaboration, mutual understanding between researchers and community members guide all phases of the research process. Although this requires a broad and more flexible approach, it can make research practices more inclusive and democratic and can create opportunities for advancing environmental justice (Morello-Frosch et al.; Morrens et al. 2017¹⁶). Setting up such processes however is time-consuming.

6.1 Informed consent

Participation in research projects involving research participants must be carried out on a voluntary basis and must include obtaining and clearly documenting participants' informed consent in advance.

Participants must be given an **informed consent** form and detailed information sheets that:

- are written in a language and in terms they can fully understand (adhering to the requirements of ethics approval legislation and ethics committees and the requirements of GDPR, see Art. 7, 12, 34);
- describe the aims, methods and implications of the research, the nature of the participation and any benefits, risks or discomfort that might ensue;
- explicitly state that participation is voluntary and that anyone has the right to refuse to participate and to withdraw their participation, samples or data at any time — without any consequences;
- state how biological samples and data will be collected, protected during the project and either destroyed or reused subsequently;
- state what procedures will be implemented in the event of unexpected or incidental findings (in particular, whether the participants have the right to know, or not to know, about any such findings).

The Principal investigator (PI) of an actual study (or persons delegated to this task) must ensure that potential participants have fully understood the information and do not feel pressured or coerced into giving consent. The PI has to ensure the correct procedure is in place within the study protocol.

Participants must normally give their consent in writing (e.g. by signing the **informed consent** form and **information sheets**).

If consent cannot be given in writing, for example because of illiteracy, non-written consent must be formally documented and independently witnessed.

¹³ Cordner A., Ciplet D., Brown P., Morello-Frosch R., Reflexive Research Ethics for Environmental Health and Justice: Academics and Movement-Building, *Soc Mov Stud.*, 2012 ; 11(2): 161–176

¹⁴ Costello A, Zumla A. Moving to Research Partnerships in Developing Countries. *British Medical Journal*. 2000; 321(7264):827–829

¹⁵ Morello-Frosch, R., Brody J. G., Brown P., Altman R.G., Rudel R.A., Perez. C, Toxic Ignorance and Right-to-Know in Biomonitoring Results Communication: A Survey of Scientists and Study Participants, *Environmental Health*, 2009; 8:6.

¹⁶ Morrens B., Den Hond E., Schoeters G., Coertjens D., Colles A., Nawrot T.S., Baeyens W., De Henauw S., Nelen V., Loots I., Human biomonitoring from an environmental justice perspective : supporting study participation of women of Turkish and Moroccan descent, *Environmental health* - ISSN 1476-069X - 16(2017), 48

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Regarding the HBM4EU, an extensive work I WP7 on developing guidelines and forms for the information process and obtaining the informed consent has been carried out. In the latest deliverable from WP7, deliverable 7.4, (insert link) the general considerations for effective communication with participants in HMB4EU are described, materials to support recruitment, materials to support fieldwork, material to support the reporting of personal results to the participants are provided. Furthermore, guidelines for the development of key communication products for survey participants are provided.

Broad and dynamic consent

Informed consent is the process by which an adequately informed person can participate in choices about his/her health care and participation in research. Its purpose is to enable potential participants to make informed choices about themselves and to safeguard their own best interests, in the full knowledge of risks versus potential benefits. The traditional version of the consent, that has to be given from the participants every time their data or biomaterial is used in new projects, is time-consuming requesting renewed approval by the Ethics Committee.

Another alternative is a **broad consent**, a consent to a range of research questions within certain limits, including upcoming research questions.

Dynamic consent is an alternative to broad consent placing the participants in the centre. The dynamic consent is an ongoing process facilitated by modern communication strategies to inform, involve, and obtain consent for every research question based on biobank resources, thus giving the participants more control over “their” data and access to information about projects. The issue of dynamic consent is also considered a way of informing about results becoming available many years after sampling. Broad consent and dynamic consent are being debated worldwide with regard to ethical concerns. Both formats of consents are highly relevant for the HBM4EU¹⁷.

Assent and consent for persons unable to give consent, including children

For research involving persons unable to give consent and children, informed consent must be obtained from the legally authorised representative and it must be ensured that they have sufficient information to enable them to provide this on behalf and in the best interests of the participants.

When planning on enrolling older children as research participants, it is important to include measures to obtain the assent of the older child as well as the consent of the parent/parents of the participation of the child in the research project.

Informed assent means a child's agreement (acquiescence) to research procedures in circumstances where he or she is not legally authorized or lacks sufficient understanding for giving consent competently. Whenever possible, the assent of the participants should be obtained in addition to the consent of the parents or legal representatives. Participants must be asked for consent if they reach the age of majority in the course of the research project. Dissent should be respected. See chapter 13, Children.

¹⁷ Knudsen LE Report from EU Bridge Health Horizontal activity 7 on ethical issues. <http://www.bridge-health.eu/sites/default/files/HA7reportApril2017.pdf>

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Recommendations – Models for informed consent and assent

- Check HBM4EU recommendations, guidelines and forms in WP7 for information, assent and consent of vulnerable groups.
- Secure consistency between what you state in the information material and the consent forms about secondary use of samples and data for research purposes and for transfer of samples and data to other repositories (HBM4EU and IPCHEM) - The consent of the research participant in the signed informed consent form is the legal basis for all use of samples and data.
- Check your national legal system and ethics committee system for national requirements regarding models for consent and assent
- Remember to create a special assent/consent form for the child – so it will be possible to find the form when the child reaches the age of majority

6.2 Law and ethics ¹⁸

The law is described as the set of rules and regulation, created by the government to govern the whole society. The law is universally accepted, recognized and enforced. It is created with the purpose of maintaining social order, peace, justice in the society and to provide protection to the general public and safeguard their interest. It is made after considering ethical principles and moral values.

The law is made by the judicial system of the country. Every person in the country is bound to follow the law. It clearly defines what a person must or must not do. So, in case of a breach of law, the breach may result in punishment or penalty or sometimes both.

By ethics, we mean that branch of moral philosophy that guides people about what is good or bad. It is a collection of fundamental concepts and principles of an ideal human character. The principles help us in making decisions regarding, what is right or wrong. It informs us about how to act in a particular situation and make a judgment to make better choices for ourselves.

Ethics are the code of conduct agreed and adopted by the people. It sets a standard of how a person should live and interact with other people (see Figure 1).

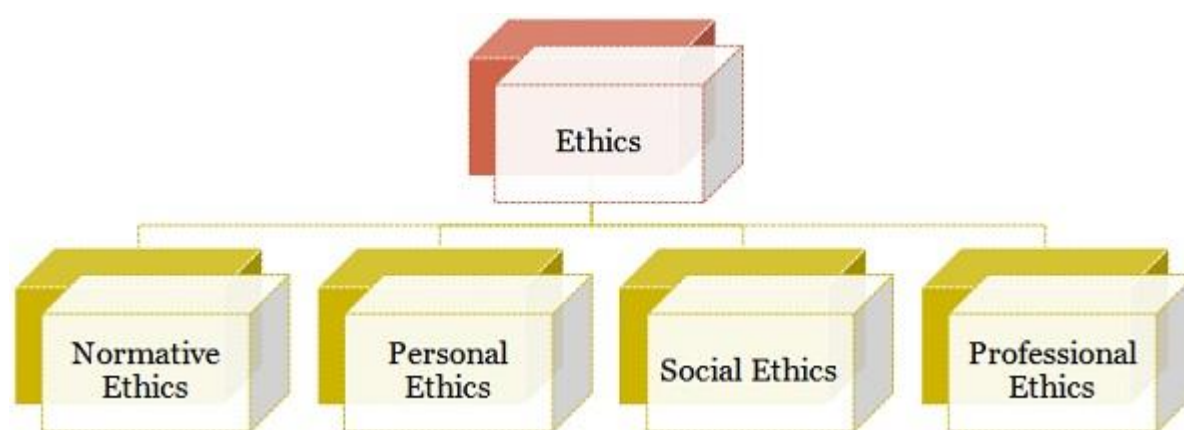


Figure 1: Key Differences between law and Ethics¹⁹

¹⁸ <http://keydifferences.com/difference-between-law-and-ethics.html>

¹⁹ Table from "Key differences between law and ethics" <https://keydifferences.com/difference-between-law-and-ethics.html>

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The major differences between law and ethics are:

1. The law is defined as the systematic body of rules that governs the whole society and the actions of its individual members. Ethics means the science of a standard human conduct.
2. The law consists of a set of rules and regulations, whereas Ethics comprises of guidelines and principles that inform people about how to live or how to behave in a particular situation.
3. The law is created by the Government, which may be local, regional, national or international. On the other hand, ethics are governed by an individual, legal or professional norms, i.e. workplace ethics, environmental ethics and so on.
4. The law is expressed in the constitution in a written form.
5. The breach of law may result in punishment or penalty, or both which is not in the case of breach of ethics.
6. The objective of the law is to maintain social order and peace within the nation and protection to all the citizens. Unlike, ethics that are the code of conduct that helps a person to decide what is right or wrong and how to act.
7. The law creates a legal binding, but ethics has no such binding on the people.

Law and ethics are different in a manner that what a person must do and what a person should do. The former is universally accepted while the latter is ideal human conduct, agreed upon by most of the people. Although, both the law and ethics are made in alignment so that they do not contradict each other. Both go side by side, as they provide how to act in a particular manner. Every person is equal in the eyes of law and ethics, i.e. nobody is superior or inferior. Further, these two allows a person to think freely and choose.

Read more: <http://keydifferences.com/difference-between-law-and-ethics.html#ixzz4pilA8mcJ>

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7 Specific Issues of Law and Ethics for HBM4EU

The General Ethics Obligations for HBM4EU are described in the Grant Agreement Article 34²⁰, see Annex 3.

An ethics review was performed by the Commission prior to the grant agreement signature, resulting in a series of ethics requirements (see Annex 4) and the addition of a WP17, which contains corresponding deliverables. Due to the fact that HBM4EU is implemented through Annual Work Plans (AWPs), these requirements are to be fulfilled on an annual basis in the Ethics Reports (ER) accompanying the Annual Work Plans in ethics reports in M9, 21, 33 and 45.

The ethics analysis also stressed the formation of an independent Ethics Board to be part of the governance structure.

During the first 18 months of HBM4EU, the First and the Second Ethics Report (Deliverable 1.1 and Deliverable 1.6) have been finalised, identifying the ethics related to the WPs and setting up a procedure to ensure ethics compliance.

Ethics issues related to WPs identified during the first 6 months are shown in Table 1 and include:

1. Planning and performance of new studies with human participants, including children
2. Performing new analyses and data collection (e.g. health data) from existing cohorts and studies (DEMOCOPHES)
3. Use of cells and tissues from projects (cohorts, studies outside HBM4EU, biobanks)
4. New or existing data from animal studies to be specified
5. Data protection issues in relation to the sharing of personal data via the IPCHEM and the HBM4EU repository
6. Consent: Aligning the information process prior to consent and the consenting procedures in new HBM4EU projects with the lawful bioethics principles and the lawful principles protecting the research participants in the GDPR.

All these issues are covered by this policy paper, which in addition includes issues related to occupational health studies, genetic information and psychological/socioeconomic information.

The policy paper sets requirements for the partners in HBM4EU, and will be updated at regular intervals to include emerging ethics and legal issues identified in the annual ethics reports.

The policy paper complements the Data Management Policy developed for IPCHEM. A separate deliverable 10.1 (D10.1) has been provided for the transfer of data into IPCHEM. The attachment to the Deliverable Report D10.1 gives the necessary documents to be used for data transfer. By June 2018, the Data Management Policy for IPCHEM is under revision with the view of aligning the IPCHEM - Policy to the requirements of the GDPR.

Table 1: Overview of ethics issues identified in HBM4EU

WP	Ethics	Comment
WP1: Project coordination and management	Agreement in Consortium on how to handle timely provision of ethics documents	Deliverables of annual ethics reports, and contributions to annual work plans must comply with the agreed procedure holding the WP leader and partners

²⁰ http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf

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		responsible for delivering, and Task 1.5 of keeping track.
WP2: Knowledge Hub	Training	Webinars and courses, all including ethics – basic and advanced.
WP3: Internal calls	-	Ethics and consent procedures and national ethics approvals need to be in place before HBM4EU financing.
WP4: Prioritisation and development of scoping documents	Focus interviews will be performed	Guidelines for focus interviews and how to protect participants to be developed within the WP.
WP5: Translation of results into policy	Primary data via IPCChem	Compliance with the Data Management Plan (DMP) and alignment with principles for lawful processing of data according to GDPR is requested.
WP6: Sustainability and capacity building	Questionnaire and focus interview	Guidelines for focus interviews and questionnaires to individuals - how to protect participants to be developed within the WP.
WP7: Survey design and fieldwork preparation	Reference to 1 st material for communication to participants, including informed consent (Deliverable Report D7.4)	Guidelines for focus interviews and how to ensure the rights of participants as research participants and data subjects to be developed within the WP. Specific focus on ethics: Children, and other vulnerable groups must be identified. Information and informed consent (D 7.4)
WP8: Targeted field work surveys and alignment at EU level	Aligned and new studies. Secondary use of samples, data, and health information	Compliance with HBM4EU procedures. Ensure all documents are in place before starting. Children and vulnerable groups?
WP9: Laboratory analysis and quality assurance	Secondary use of samples, data and issues of transfer Animal data new or existing	Compliance with HBM4EU procedures Policy on issues related to development of new analytical methods and use of human samples to be developed. Material Transfer Agreements are to be collected
WP10: Data management and analysis	Sharing of data via IPCHeM, Article 6 of the IPCHeM Data Policy ²¹ .	The protection of personal data, licensing conditions, commercial interests and intellectual property rights, and contractual obligations restricting access

²¹ IPCHeM Data Policy (<http://publications.jrc.ec.europa.eu/repository/bitstream/JRC95307/lb-na-27163-en-n%20.pdf>)

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	Developing HBM4EU database and ethics in a share point database	to data to be ensured – and the alignment with principles of lawful processing according to GDPR
WP11: Linking HBM, health studies and registries	Data protection issues related to linking of HBM to health information and to administrative registers	Compliance with data protection according to GDPR and according to other EU data protection regulations regulating the processing of data by EU institutions Children and vulnerable groups?
WP12: From HBM to exposure	Secondary use of data	Compliance with the DMP
WP13: Establishing exposure-health relationships	Secondary use of data and samples, transfer New human studies initiated	Compliance with the DMP and the HBM4EU procedures. Material Transfer Agreements (MTAs) are to be collected Children and vulnerable groups?
WP14: Effect biomarkers	Secondary use of data and samples, transfer New human studies initiated Animal data new or existing	Compliance with the DMP and the HBM4EU procedures. Material Transfer Agreements (MTAs) are to be collected Children and vulnerable groups?
WP15: Mixtures, HBM and human health risk	Secondary use of data and samples, transfer New human studies initiated Animal data new or existing	Compliance with the DMP and the HBM4EU procedures Children and vulnerable groups? Material Transfer Agreements (MTAs) are to be collected
WP16: Emerging chemicals	Secondary use of data and samples, transfer New human studies initiated Animal data new or existing	Compliance with the DMP and the HBM4EU procedures

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Study protocol

A study protocol must be developed initial to any HBM activity including information as e.g. in the DEMOCOPHES study protocol with the outline shown²²:

Table 2: Overview of information in Study Protocol

Background Information	European Environment and Health Action Plan Common European Pilot Study Protocol Need for flexibility Support
Study Objective	
Summary	
Management of the Study	At National Level At European Level
Study Design	Representativity Study population
Field work	Organisation and instruments Scheduling of Field Work: Procedure of Participant Recruitment: The essential field instruments for the Pilot Study Questionnaires, Interviews and Data Sheets Quality Control Measures
Biological Material	Choice of Agents and Biomarkers under Investigation Focus on Standardisation Pre-Analytical Phase Analytical Phase Repartition of Tasks Post Analytical Phase
Data Management, Analysis and Evaluation	Data Management Data Evaluation Communication Plan Basic Options and Strategy Communication Campaigns Communication Material Websites
Ethics and Data Protection	Overall Approach Ethical Committee and Data Protection Authority
Training and Support	General Approach

²² <http://www.eu-hbm.info/cophes/download/common-european-pilot-study-protocol/view>

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7.1 Procedure for identifying and reporting ethics in the consortium

The consortium is committed to follow the ethics review process required for all human and animal research studies, and all partners have obliged to comply with the EU and national regulations and provide all necessary and requested documents in due time. The process for obtaining and storing required documents (ethics approval, informed consent etc.) and providing them to the EC is as follows (see also Figure 2):

- Identification of data and samples to be used in the HBM4EU. The WP leaders and the partners involved will be responsible for the identification of appropriate data or samples.
- WP leaders will inform Task 1.5 leader about selected studies before data/samples are used within the WP.
- Partners responsible for studies which will be included are obliged to provide all required ethics documents to the Task 1.5 leader as soon as use of data/samples have been agreed with WP leader(s) and no later than 6 weeks before the work on data/samples is planned to start.
- Task 1.5 leader will keep a list of included studies. This list will be made available on the HBM4EU website (<http://www.hbm4eu.eu>) and updated regularly (every 4 weeks).
- Task 1.5 leader will provide collected documents to the Coordinator (UBA) every 4 weeks.
- The Coordinator will then upload a list of collected documents to the Participant Portal.

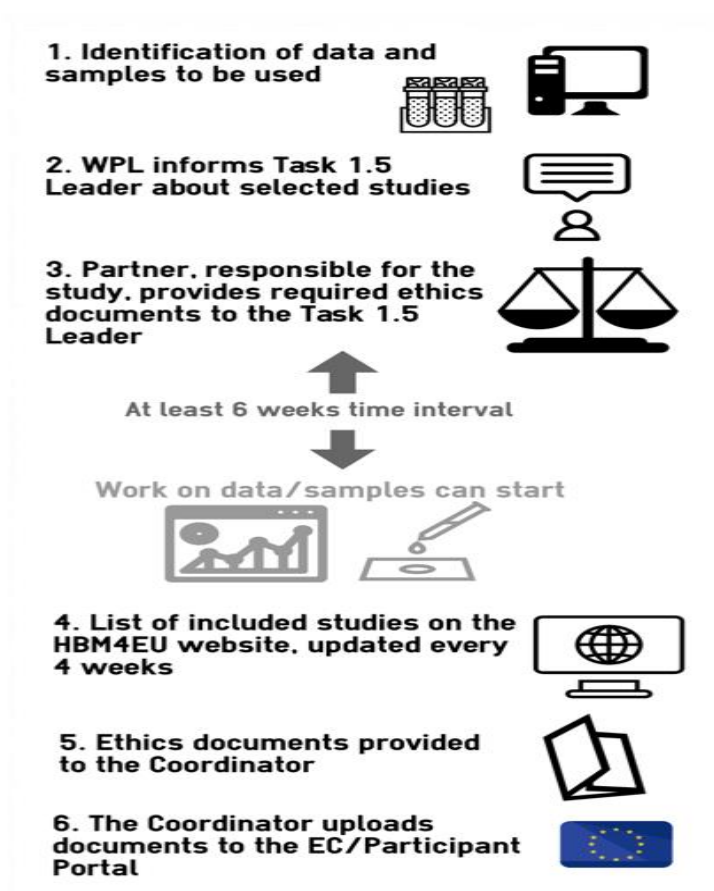


Figure 2: Ethics Process in HBM4EU (figure made by Hanna Tolonen, THL)

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Requirements for studies and cohorts

For studies and cohorts to be included and used in the HBM4EU, the following documents and information needs to be provided in due time and unless otherwise agreed in time for the Annual Ethics Report, to the Task 1.5 leader.

- Name of the study in national language and translated into English, acronym of the study, webpage of the study;
- Host institution and contact person(s), including their acronym as used in HBM4EU
- References to WPs and Tasks which will make use of samples/data;
- When will work start;
- Name and contact details of local ethics and data management experts
- Copy of informed consent and information to participants in national language and in English if available;
- Date(s) and name(s) of issuing bodies of ethics approvals, copy of approval;
- Date(s) and name(s) of issuing bodies of data protection, copy of approval;
- Date(s) and name(s) of issuing bodies of biobanking, copy of approval;
- Summary in English covering: Secondary use in informed consent. Secondary use allowed according ethics approvals. Expiry date of ethics approval. Data protection approvals. Expiry dates of data protection. Biobank approvals. Expiry dates of biobank data. Data and Material Transfer Agreements between which partners and eventual expiry dates.
- Information about the conditions and type of data transferred
- Material Transfer Agreements from donating and from receiving institution, copies;
- Timeframe to make the documents available, e.g. new applications for transfer documents.
- Filled in by (name, e-mail, telephone number);
- Filled in on date;
- Received by task leader 1.5 date.

An Excel template to support submission of required documents and information has been prepared (see Annex 1).

Material Transfer Agreements

A Material transfer Protocol is set in place for transfer within HBM4EU ensuring ethics approval of secondary use of samples. See the HBM4EU Material Transfer Protocol: <https://www.hbm4eu.eu/mdocs-posts/sample-transfer-protocol/>

Survey participation

For studies with human participation the information material must clearly state and ensure written consent to the use of individual data within HBM4EU and take potential secondary use into account, including the possibility for record linkage to administrative data sources. Prior to recruitment, the study participants must be informed about their rights to know and right not to know their own study results. HBM4EU initiated studies are recommended to set up uniform insurance for study participants. On this, national/institutional regulations/procedures have to be followed.

Details from the Commission guidelines are provided in Annex 5 'Specific recommendations – human studies/cohorts.

Reference is made to the deliverable D7.4 “1st material for communication to participants, including informed consent”. The recommendations in the deliverable D7.4 are ordered according to the chronological process of a research project: The information in relation to the first contact with

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research project candidates, the information to research candidates, information about reflection time before deciding whether to join the research project, the informed consent forms, information for children, information for young persons' assent (15-17 years of age), information about withdrawal from the research project, information about secondary use of samples and data, and about transfer of samples and data to other countries.

Working with cells and tissues

Research with cells and tissues must comply with ethical principles, especially informed consent, from the donor and applicable international, EU and national law (in particular, EU Directive 2004/23/EC).

Details from the Commission guidelines are provided in Annex 6 'Specific recommendations when using, producing or collecting human cells or tissues.

Animals

When experimental studies include animals, the studies must comply with ethical principles, applicable national, EU and international law, in particular, EU Directive 2010/63/EU²³. HBM4EU has not yet clarified the use of animal data and eventual new studies. More detailed procedures will be included in the policy paper when available. Details from the Commission guidelines are provided in Annex 7 'Specific recommendations for animal studies'.

²³ Directive 2010/63/EU Of The European Parliament And Of The Council of 22 September 2010 on the protection of animals used for scientific purposes <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0063&from=EN>

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8 Ethical/legal instruments to take into consideration in HBM4EU

Overview of binding and non-binding instruments in Europe, in addition to the national laws and requirements in the respective country of your research. Additional instruments might be of relevance in the context of HBM4EU.

8.1 Binding instruments:

- European Convention for the Protection of Human Rights and Fundamental Freedoms, 1950²⁴;
- Charter of Fundamental Rights of the European Union, OJ C 326, 26 October 2012²⁵
- Council of Europe Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine (Oviedo Convention), 4 April 1997²⁶; as well as relevant additional protocols such as Additional Protocol on the Prohibition of Cloning Human Beings, 12 January 1998²⁷;
- Directive 2004/23/EC of the European Parliament and of the Council of 31 March 2004 on setting standards of quality and safety for the donation, procurement, testing, processing, preservation, storage and distribution of human tissues and cells²⁸;
- Directive 2006/17/EC implementing Directive 2004/23/EC as regards certain technical requirements for the donation, procurement and testing of human tissues and cells²⁹;
- Directive 2006/86/EC implementing Directive 2004/23/EC as regards traceability requirements, notification of serious adverse reactions and events and certain technical requirements for the coding, processing, preservation, storage and distribution of human tissues and cells³⁰;
- Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions³¹;
- EU General Data Protection Regulation; Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector³²
- REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)³³

8.2 Non-binding instruments:

- WMA Declaration of Helsinki, Brazil, 2013; The World Medical Association (WMA) has developed the Declaration of Helsinki as a statement of ethical principles for medical

²⁴ https://www.echr.coe.int/Documents/Convention_ENG.pdf

²⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:C:2012:326:FULL>

²⁶ <https://rm.coe.int/168007cf98>

²⁷ <https://rm.coe.int/168007f2ca>

²⁸ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:102:0048:0058:en:PDF>

²⁹ http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2006.038.01.0040.01.ENG&toc=OJ:L:2006:038:TOC

³⁰ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32006L0086>

³¹ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31998L0044>

³² <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0058:en:HTML>

³³ <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679&from=EN>

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research involving human subjects, including research on identifiable human material and data³⁴

- OCDE Guidelines for Human Biobanks and Genetic Research Databases (HBGRDs), 2009³⁵;
- Council of Europe Rec(2004)10 concerning the Protection of the Human Rights and Dignity of Persons with Mental Disorder³⁶;
- Recommendation CM/Rec(2016)6 of the Committee of Ministers to member States on research on biological materials of human origin³⁷;
- ISBER Best practices for repositories: collection, storage, retrieval, and distribution of biological materials for research, third edition, 2012³⁸;
- EGE, European Group on Ethics in Science and New Technologies relevant Opinions³⁹;
- Article 29 Data Protection Working Party opinions and recommendations⁴⁰;
- EuroBioBank SOPs⁴¹;
- OECD Principles and Guidelines for Access to Research Data from Public Funding, 2007⁴²;
- Global alliance, International code of conduct for genomic and health-related data sharing⁴³;
- HUGO Ethics Committee Statement on benefit sharing, 2009⁴⁴;
- Singapore Statement on Research Integrity, 2010⁴⁵
- WMA Declaration of Taipei 2016⁴⁶
- The Oviedo Convention on Human Rights and Biomedicine⁴⁷
- Council of International Organizations of Medical Sciences and WHO in 2002: International Ethical Guidelines for Biomedical Research Involving Human Subjects (CIOMS and WHO 2002).⁴⁸
- The Belmont report “Ethical Principles and Guidelines for the Protection of Human Subjects of Research” (NIH 1979);⁴⁹

³⁴ <https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/>

³⁵ <https://www.oecd.org/sti/biotech/44054609.pdf>

³⁶ [https://www.coe.int/t/dg3/healthbioethic/Activities/08_Psychiatry_and_human_rights_en/Rec\(2004\)10%20EM%20E.pdf](https://www.coe.int/t/dg3/healthbioethic/Activities/08_Psychiatry_and_human_rights_en/Rec(2004)10%20EM%20E.pdf)

³⁷ https://search.coe.int/cm/Pages/result_details.aspx?ObjectId=090000168064e8ff

³⁸ http://biorepository.uic.edu/Contact_Us_files/ISBERBestPractices3rdedition.pdf

³⁹ http://www.coe.int/t/dg3/healthbioethic/cometh/ege/20091118%20finalSB%20_2_%20MP.pdf

⁴⁰ http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/index_en.htm

⁴¹ <http://www.eurobiobank.org/en/documents/sops.htm>

⁴² <http://www.oecd.org/sti/sci-tech/38500813.pdf>

⁴³ <https://link.springer.com/article/10.1186/1877-6566-8-1>

⁴⁴ <http://www.eubios.info/BENSHARE.htm>

⁴⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3954607/>

⁴⁶ <https://www.wma.net/policies-post/wma-declaration-of-taipei-on-ethical-considerations-regarding-health-databases-and-biobanks/>

⁴⁷ <http://www.coe.int/de/web/conventions/full-list/-/conventions/rms/090000168007cf98>

⁴⁸ <https://cioms.ch/shop/product/international-ethical-guidelines-for-health-related-research-involving-humans/>

⁴⁹ https://videocast.nih.gov/pdf/ohrp_appendix_belmont_report_vol_2.pdf

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9 The General Data Protection Regulation (GDPR)

HBM4EU is involved with a considerable amount of processing of both newly generated personal data, and the secondary processing of already gathered personal data.

The key legislation under which the project must operate is the General Data Protection Regulation 2016/679. The GDPR is the branch of human rights protecting the rights of the data-subject thus supplementing the bioethical principles protecting the study participant. This concerns personal data that are processed in the EU (where processing includes very broadly, any action on personal data). The Regulation came into force with direct effect in the EU Member States from May 25th, 2018. It does not require national governments to pass any enabling legislation and is thus directly binding and applicable.

Before then, Member States have each created their own Data Protection Laws in conformity with the EU Directive 95/46/EC on the processing of personal data. The GDPR produces a higher standard than that under Directive 95/46/EC, and therefore HBM4EU will work to the higher standard; HBM4EU will ensure that it complies to current local laws by discussion of its protocols for data processing with relevant national Supervisory Authorities (see Art. 56, 61, 60, 62).

The Regulation, following the pattern of data protection law established in the late 1970s, has four elements: the principles; the route to lawful processing; the information provisions; and, the rights of the data subjects.

Data protection legislation concerns personal data - *“any information relating to an identified or identifiable natural person (‘data subject’); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person”* (Art. 4.1).

It concerns the processing of such personal data, where processing means *“any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organisation, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction”* (Art. 4.2). It can be seen that HBM4EU both falls squarely within these definitions, and equally that it poses interesting questions, for example about the nature of processing of already gathered personal data, and the use of data that has been pseudonymised, but is handed to a secondary processor of data in an unidentifiable form (where a scientist gains a de-identified dataset from another, but the dataset remains identifiable, if coded, in the hands of the original data controller). Part of the work of HBM4EU will be to reflect on the problems that its work poses for the new Regulation.

9.1 Data Protection Principles

The Regulation makes clear a number of rights and principles that must apply to the processing of personal data (Art. 5). The data must be processed *“lawfully, fairly, and in a transparent manner”* (Art. 5.1a), and for specific purposes, and not further processed in an incompatible manner (Art. 5.1b). Article 6.4 provides that it is possible to process data for further compatible purposes, and that with safeguards. The principle of data minimisation requires that only personal data sufficient for the purpose be processed (Article 5.1c), and that it should be accurate (Art. 5.1d).

Under Article 5.1e, the principle of ‘storage limitation’ applies: *“personal data shall be kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for*

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which the personal data are processed; personal data may be stored for longer periods insofar as the personal data will be processed solely for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89(1) subject to implementation of the appropriate technical and organisational measures required by this Regulation in order to safeguard the rights and freedoms of the data subject”.

And under Article 5.1f, *“personal data shall be processed in a manner that ensures appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organisational measures”.* HBM4EU will observe both the spirit and letter of these principles, and the way that they are interpreted and developed as the Regulation is implemented.

The Route to Lawful Processing

HBM4EU will use “informed consent” as the route to lawful processing (under Article 6.1a and 9.2a). The protocols that HBM4EU will use to gain and record those consents will be approved by local research ethics committees and will be drafted in consultation with national Data Protection Supervisory Authorities. This is for two reasons: only such bodies have authority to authorise the use of such protocols; the Regulation is ambiguous on the nature and place of broad consent to be applied (see in particular Art. 4.11 in comparison with Recitals 33 and 50). Further, HBM4EU wishes to explore the opportunities for ‘dynamic consent’, both in terms of how it might operate under the Regulation, and how the principles might be developed technically. This will be undertaken to understand and develop the participants’ right to withdraw from the projects. HBM4EU will also explore with the national Data Protection Supervisory Authorities the extent of ‘compatible processing’ under Article 6.4, and how that operates in relation to the secondary processing of already gathered health datasets.

The GDPR contains provisions regulating the use of personal data from living natural persons for research purposes. While the GDPR is directly applicable, it leaves room for additional national legislation, for example in the area of scientific research (Art. 89). According to the GDPR, the conditions for lawful processing of the data are listed in Article 6. The conditions for consent of the data subject are listed in Article 7.

9.2 Material scope (Article 2)

The GDPR sets out provisions for the processing of data from living natural persons. The remit of the Regulation covers data directly referable to the data subject (identifiable data) and data that have been pseudonymised (indirectly identifiable data). Completely anonymised data, where it is impossible to re-identify the data-subject, do not fall within the remit of the GDPR.

9.3 Biological samples and the GDPR

The Regulation does not directly mention how biological samples are to be categorized according to the Regulation. The term “personal data” is interpreted broadly by the GDPR: *“Any information related to a natural person or ‘Data Subject’, which can be used to directly or indirectly identify the person, constitutes “personal data”. It can be anything from a name, a photo, an email address, bank details, posts on social networking websites, medical information, or a computer IP address”.*

In spite of the broad definition of the term “personal data” there are pointers indicating that GDPR does not regard the biological sample per se as personal data: According to Recital 34 in the Regulation “Genetic data should be defined as personal data relating to the inherited or acquired genetic characteristics of a natural person which result from the analysis of a biological sample from

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the natural person in question, in particular chromosomal, deoxyribonucleic acid (DNA) or ribonucleic acid (RNA) analysis, or from the analysis of another element enabling equivalent information to be obtained.”

According to Recital 34, only the personal data “*which result from the analysis of a biological sample from the natural person in question*” is to be considered personal data falling under the scope of GDPR. Even though GDPR sets up rules for the processing of personal data throughout the EU, it will remain difficult to harmonize the legal landscape regulating biobanking and the use of personal data derived from the biological samples, because Recital 34 indicates that the GDPR does not consider a biological sample per se to be personal data. The application of the GDPR to data derived from analysis of a biological sample may be applied at the later stage of research where information (data) is derived from a biological sample and processed in relation to a research project. The research activities related to the use of data derived from biological samples may be regarded as scientific research and could then be seen as falling under the scope of Article 89 and as such could be subject to national derogations introduced by Member State law.

9.4 Territorial scope

The GDPRs jurisdiction covers all data processing done on data from data-subjects from the European Union no matter where the processing takes place: Article 3 states: “*This Regulation applies to the processing of personal data in the context of the activities of an establishment of a controller or a processor in the Union, regardless of whether the processing takes place in the Union or not.*”

Where no EU presence exists, the GDPR will still apply whenever: (1) an EU resident’s personal data is processed in connection with goods/services offered to him/her; or (2) the behaviour of individuals within the EU is “monitored”. The question of territorial scope appears to be less relevant than the considerations regarding material scope of the GDPR.

The GDPR has extended the jurisdiction of the EU-data protection as it applies to all companies processing the personal data of data subjects residing in the Union, regardless of the company’s location. GDPR makes its applicability very clear - it will apply to the processing of personal data by controllers and processors in the EU, regardless of whether the processing takes place in the EU or not. The GDPR will also apply to the processing of personal data of data subjects in the EU by a controller or processor not established in the EU, where the activities relate to: offering goods or services to EU citizens (irrespective of whether payment is required) and the monitoring of behaviour that takes place within the EU. Non-EU businesses processing the data of EU citizens will also have to appoint a representative in the EU.

9.5 Defining research according to the GDPR

In a post on the web site of the International Association of Privacy Professionals (IAPP) “How GDPR changes the rules for research”⁵⁰ Gabe Maldoff analyses how the GDPR defines research:

Scientific research is defined “in a broad manner” (Recital 159). The Recital supplies examples, such as “technological development and demonstration, fundamental research, applied research, and privately funded research,” as well as studies conducted in the public interest in the area of public health. Additionally, “specific conditions should apply in particular as regards the publication or

⁵⁰ ‘How GDPR Changes the Rules for Research’ <<https://iapp.org/news/a/how-gdpr-changes-the-rules-for-research/>> [accessed 7 January 2018].

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otherwise disclosure of personal data in the context of scientific research purposes”. Although not explicitly stated, these “specific conditions” may refer to “recognized ethics standards for scientific research,” which are discussed in Recital 33 as well as the safeguards outlined in Article 89.”

Public health research is treated as a subset of scientific research under the GDPR (see Recital 159), and, therefore, the same exemptions and requirements apply. However, the GDPR also contains several provisions applicable exclusively to public health research. The GDPR encourages the member states to enact greater protections for the processing of sensitive data for health-related purposes. Recital 53 states that, although the Regulation is intended to create “harmonized conditions for the processing of special categories of personal data concerning health, [...] Union or member state law should provide for specific and suitable measures so as to protect the fundamental rights and the personal data of natural persons.” This is particularly the case where the controller processes genetic, biometric or health data.

Second, Article 49 permits the transfer of personal data to third countries that do not offer an adequate level of protection if “the transfer is necessary for important reasons of public interest,” which may include public health research. Recital 112 explains that this derogation applies especially “for example in the case of contact tracing for contagious diseases or in order to reduce and/or eliminate doping in sport.”

Controllers conducting public health research may be subject to heightened requirements for consulting supervisory authorities about their processing activities. Article 36 requires controllers to consult with a supervisory authority prior to processing that may result in a “high risk” to data subject rights. Even in the absence of a high risk, however, “Member State law may require controllers to consult with, and obtain prior authorization from, the supervisory authority.”

Recital 54 defines public health according to Regulation (EC) No. 1338/2008 as “all elements related to health, namely health status, including morbidity and disability, the determinants having an effect on that health status, health care needs, resources allocated to health care, the provision of, and universal access to, health care as well as health care expenditure and financing, and the causes of mortality.”

9.6 Penalties

Under GDPR, organizations breaching the GDPR can be fined up to 4% of annual global turnover or €20 Million (whichever is greater). This is the maximum fine that can be imposed for the most serious infringements e.g. not having sufficient customer consent to process data or violating the core of Privacy by Design concepts. There is a tiered approach to fines e.g. a company can be fined 2% for not having their records in order (Obligations of Controller, Article 28), not notifying the supervising authority and data subject about a breach or not conducting impact assessment.

According to the Article 29 Working Group (an EU-advisory group that has the task of producing guidelines for the use of the EU Data Protection Directive and also for the future use of the GDPR) a Data Protection Impact Assessment (DPIA) is a process designed to describe the processing, assess the necessity and proportionality of a processing and to help manage the risks to the rights and freedoms of natural persons resulting from the processing of personal data (by assessing them and determining the measures to address them).

In the guidelines of the Article 29 Working Party of April 2018, it is stated that DPIAs are important tools for accountability, as they help controllers not only to comply with requirements of the GDPR, but also to demonstrate that appropriate measures have been taken to ensure compliance with the Regulation. A DPIA is thus a process for building and demonstrating compliance.

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Under the GDPR, non-compliance with DPIA requirements can lead to fines imposed by the competent supervisory authority. According to the Article 29 working Party, failure to carry out a DPIA when the processing is subject to a DPIA (Art. 35(1) and (3)), carrying out a DPIA in an incorrect way (Art. 35(2) and (7) to (9)), or failing to consult the competent supervisory authority where required (Art. 36(3)(e)), can each result in an administrative fine of up to 10M€, or in the case of an undertaking, up to 2 % of the total worldwide annual turnover of the preceding financial year, whichever is higher.

The term “Privacy Impact Assessment” (PIA) is often used in other contexts to refer to the concept of DPIA.

9.7 The concept of consent according to GDPR

According to the Commission, the conditions for consent have been strengthened, as the request for consent from the person the data concerns (the data subject) must be given in an intelligible and easily accessible form, with the purpose for data processing clearly stated in the information to material to the data subject. Consent must be clear and distinguishable from other matters and provided in an intelligible and easily accessible form, using clear and plain language. It must be as easy to withdraw consent, as it is to give it. This is an important point that needs to be carefully considered when formulating the consent material for the future research in the HBM4EU project.

GDPR-Consent: Research-purposes

Special provisions in the GDPR pave the way for using data without consent in relation to research- and statistical purposes. The general impression is that the GDPR has opened the possibilities for using data for research purposes – in some cases without consent – under the condition of balancing the interests of the data-subject with the societal interest vested in supporting the development of new research. It is yet to be clarified whether this will apply to survey data and if yes, to what extent. It remains to be seen how the different member states will interpret this provision. It also remains to be clarified if there are other EU- or national provisions providing more stringent regulation protecting the fundamental rights of the data subject.

9.8 GDPR and research

The GDPR introduces an increased level of responsibilities for the data controller and the data processor in order to secure transparency of the use of data and the autonomy of the data subject: a) The right to be forgotten; b) the right to having data transferred and deleted; and c) the right to be notified in case of security breaches. The GDPR spells out new principles and responsibility for the data controller and data processor and sets a very high level of fines in case of violation. Both private and public organisations and companies can be subjects to fines in case of breaches. It is however stated in the Recitals of the GDPR, that the regulation is not supposed to hinder the flow of data. In the field of research and statistical purposes, the GDPR specifies the legal areas for the use of data. By introducing the tool of pseudonymisation in the regulation, the GDPR also paves the way for secondary use of data under certain restrictions.

The use of totally anonymised data is not covered by the GDPR, but certain biobanks storing biological samples and data used for diagnosis- and health care services might be covered by the

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NIS directive (Network Information's Systems directive expected to be implemented in national law in 2019)⁵¹.

Although the GDPR creates increased obligations for entities that process personal data, it also creates new exemptions for research as part of its mandate to facilitate a Digital Single Market across the EU. Specifically, the GDPR exempts research from the principles of storage limitation and purpose limitation so as to allow researchers to further process personal data beyond the purposes for which they were first collected. Research may in some cases supply a legitimate basis for processing without the consent of the data subject. The Regulation also allows researchers to process sensitive data and, in limited circumstances, to transfer personal data to third countries that do not provide an adequate level of protection. To benefit from these exemptions, researchers must implement appropriate safeguards, in keeping with recognized ethics standards, that lower the risks of research for the rights of individuals.

GDPR's effect on Health Research

Gabe Maldoff gives an analysis of the GDPR and the effect of the Regulation on research and health research: "The GDPR adopts a "broad" definition of research, encompassing the activities of public and private entities alike (Recital 159)." "...it is unclear exactly how far the GDPR's research exemption will extend. One thing is clear, however: The GDPR aims to encourage innovation, as long as organizations implement the appropriate safeguards." According to Maldoff, organisations processing personal data for research purposes may avoid restrictions on secondary processing and on processing sensitive categories of data (Art. 6(4); Recital 50). As long as they implement appropriate safeguards, these organisations also may override a data subject's right to object to processing and to seek the erasure of personal data (Art. 89):

Article 89: Safeguards and derogations relating to processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes

1. Processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes, shall be subject to appropriate safeguards, in accordance with this Regulation, for the rights and freedoms of the data subject. Those safeguards shall ensure that technical and organisational measures are in place in particular in order to ensure respect for the principle of data minimisation. Those measures may include pseudonymisation provided that those purposes can be fulfilled in that manner. Where those purposes can be fulfilled by further processing which does not permit or no longer permits the identification of data subjects, those purposes shall be fulfilled in that manner.
2. Where personal data are processed for scientific or historical research purposes or statistical purposes, Union or Member State law may provide for derogations from the rights referred to in Articles 15, 16, 18 and 21 subject to the conditions and safeguards referred to in paragraph 1 of this Article in so far as such rights are likely to render impossible or seriously impair the achievement of the specific purposes, and such derogations are necessary for the fulfilment of those purposes.
3. Where personal data are processed for archiving purposes in the public interest, Union or Member State law may provide for derogations from the rights referred to in Articles 15, 16, 18, 19, 20 and 21 subject to the conditions and safeguards referred to in paragraph 1 of this Article in so far as such rights are likely to render impossible or seriously impair the

⁵¹ Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 Concerning Measures for a High Common Level of Security of Network and Information Systems across the Union, 194, 2016, OJ L <<http://data.europa.eu/eli/dir/2016/1148/oj/eng>>.

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achievement of the specific purposes, and such derogations are necessary for the fulfilment of those purposes.

4. Where processing referred to in paragraphs 2 and 3 serves, at the same time, another purpose, the derogations shall apply only to processing for the purposes referred to in those paragraphs.

9.9 Data Subject Rights: Data Controllers' and Data Processors' Obligations

The GDPR may offer new possibilities for conducting research and encourages innovation but in the case of processing of identifiable data from living persons or processing pseudonymised data (re-identifiable data), the provisions of the GDPR on data safety and the rights of the data subject still have to be adhered to by the data controller and the data processor:

Notification of Data breach

GDPR Article 33 stipulates the obligation of the data controller to notify the data subject in case of data breach: Notification of a personal data breach to the supervisory authority, breach notification will become mandatory in all member states where a data breach is likely to “result in a risk for the rights and freedoms of individuals”. This must be done within 72 hours of first having become aware of the breach. Data processors will also be required to notify their customers, the controllers, “without undue delay” after first becoming aware of a data breach. – An evaluation on whether the HBM4EU project will need to formulate a procedure for Breach Notification will probably be necessary.

The data subject's Right to Access and further rights of notification

Part of the expanded rights of data subjects outlined by the GDPR is the right for data subjects to obtain from the data controller confirmation as to whether or not personal data concerning the data subject is being processed; where it is processed and for what purpose. Further, the controller shall provide a copy of the personal data, free of charge, in an electronic format. In chapter 3. “Rights of the data subject”, the following Articles of GDPR outlines the right of data subjects with regard to the following rights: Right of access for data subject, Article 15, Right of rectification, Article 16, Right of erasure, Right to be forgotten, Article 17, Right restriction of processing, Article 18. The data controllers' obligation regarding rectification or erasure of personal data or restriction of processing, Article 19. Right to data portability, Article 20. Right to object to data processing, Article 21. Right to object to automated individual decision-making, including profiling, Article 22.

The Right to be forgotten

Also known as Data Erasure, the right to be forgotten entitles the data subject to have the data controller erase his/her personal data, cease further dissemination of the data, and potentially have third parties halt processing of the data. The conditions for erasure, as outlined in Article 17 of GDPR, include the data no longer being relevant to original purposes for processing, or a data subjects withdrawing consent. It should also be noted that this right requires controllers to compare the subjects' rights to “the public interest in the availability of the data” when considering such requests. The right practise of balancing of the interest of the data subject and the public interest is yet to be established. In relation to HBM4EU, this is rather difficult issue. When a person withdraws his/her informed consent in country x, which have provided data for HBM4EU database, the HBM4EU should be able to remove this subject from the database and from all ongoing and future analysis. If data is fully anonymized in HBM4EU database, which is very unlikely to happen, this procedure is

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not relevant but as long as there will be included pseudonymised data in the HBM4EU databases, HBM4EU should have to have a procedure for this.

Data Portability

Article 20 of the GDPR introduces the right of data portability - the right for a data subject to receive the personal data concerning them, which they have previously provided in a 'commonly use and machine-readable format' and have the right to transmit that data to another controller.

Privacy by Design and Data Minimisation

Privacy by design as a concept has existed for years now, but it is only just becoming part of a legal requirement with the GDPR. At its core, privacy by design calls for the inclusion of data protection from the onset of the designing of systems, rather than an addition. More specifically – “the controller shall implement appropriate technical and organisational measures to ensure and to be able to demonstrate that processing is performed in accordance with this Regulation” (Art. 24(1) GDPR), 'The controller shall- - Implement appropriate technical and organisational measures. In an effective way. In order to meet the requirements of this Regulation and “protect the rights of data subjects” (Art. 25 (1) GDPR). Article 25 also calls for controllers to hold and process only the data necessary for the completion of its duties (data minimisation), as well as limiting the access to personal data to those needing to carry out the processing.

Derogations to Data subject's rights of notification with regard to research

This change with regard to the rights of subjects indicates a dramatic shift towards data transparency and empowerment of data subjects.

However, Article 89 of GDPR opens possibilities of derogations to the rights of data subjects. It will be necessary to evaluate to what extent the HBM4EU is obligated to follow these requirements. – Maybe adherence to these requirements will not be necessary if the HBM4EU-projects will be considered to be research falling under the provisions of Article 89 of the GDPR. Article 89 states that the rights of the data subject in Articles 15 (Right of access to own data), 16 (Right to Rectification of inaccurate personal data), 18 (Right to restriction of processing of own data) and Article 21 (right to object to processing of personal data) can be waived. – The relation between the provisions in Article 89 and Article 15, 16, and also Article 17 (the right to erasure – the right to be forgotten) is quite complicated and definitely needs further investigation in order to clarify the implications for HBM4EU.

Data Protection Officers (DPOs)

Currently, controllers are required to notify their data processing activities with local DPAs, which, for multinational projects, can be a bureaucratic nightmare with most Member States having different notification requirements. Under GDPR (Art. 37), it will not be necessary to submit notifications / registrations to each local DPA of data processing activities, nor will it be a requirement to notify / obtain approval for transfers based on the Model Contract Clauses (MCCs). Instead, there will be internal record keeping requirements, and DPO appointment will be mandatory only for those controllers and processors whose core activities consist of processing operations, which require regular and systematic monitoring of data subjects on a large scale or of special categories of data or data relating to criminal convictions and offences. Importantly, the DPO:

- Must be appointed on the basis of professional qualities and, in particular, expert knowledge on data protection law and practices.
- May be a staff member or an external service provider.
- Contact details must be provided to the relevant DPA.

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- Must be provided with appropriate resources to carry out their tasks and maintain their expert knowledge.
- Must report directly to the highest level of management.
- Must not carry out any other tasks that could result in a conflict of interest.

9.10 Traceability of data to the data-subject

Types of data

Data can be either:

Anonymised: Non-traceable to the data subject.

Pseudonymised: Traceable to the data subject via a code.

Identifiable: Fully traceable to the data subject.

Aggregated: Aggregated data merge information of multiple patients or survey participants and the collected information cannot be retraced to the individual data.

GDPR does not directly define the term “anonymous”. In Recital 26 the concept “anonymous” is referred to in the following manner: “The principles of data protection should therefore not apply to anonymous information, namely information which does not relate to an identified or identifiable natural person or to personal data rendered anonymous in such a manner that the <https://www.edglossary.org/aggregate-data/data-subject-is-not-or-no-longer-identifiable>.”

Pseudonymised data are traceable to the data subject via a code. According to Article 4 of GDPR ‘pseudonymisation’ means the processing of personal data in such a manner that the personal data can no longer be attributed to a specific data subject without the use of additional information, provided that such additional information is kept separately and is subject to technical and organisational measures to ensure that the personal data are not attributed to an identified or identifiable natural person;

Fully traceable to the data subject. According to Article 4 of GDPR, an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person.

Individual level data comprise health and HBM information of a single patient or survey participant concerning his/her name, age, sex, HBM data, diagnosis, medical history and other relevant information. If it is envisaged to record the course of the disease of a patient over time, it is necessary to collect individual data. This is also true if you want to communicate the results to each person. Ethical and legal issues of data collection are crucial when working with individual level data.

Anonymised data fall without the remit of the Regulation. Pseudonymised and identifiable data fall within the remit of the GDPR.

Aggregated data is the consolidation of data relating to multiple patients or research participants.

Aggregated data can usually not be traced back to a specific person⁵². If data in an aggregated data-set are impossible to trace back to the person, this type of aggregated data will fall under the category

⁵² ‘1.5. Difference between Aggregated and Patient Data in a HIS’ <<https://docs.dhis2.org/2.22/en/user/html/ch01s05.html>> [accessed 12 August 2018].

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of anonymous data and as such will not fall under the remit of the GDPR. However, in rare cases, it might be possible to re-identify the persons or small groups of persons from the aggregated data – for instance in cases where data can be traced to small geographical areas. If aggregated data can reveal the identity of persons or the identity of groups of persons, the aggregated data cannot be regarded as anonymous data but as pseudonymised data, thus falling within the remit of the GDPR.

Pseudonymisation

The GDPR (Art. 4 introduces the concept of pseudonymisation as a tool for enhancing security by design. The GDPR defines pseudonymisation as:

“The processing of personal data in such a way that the data can no longer be attributed to a specific data subject without the use of additional information.” To pseudonymise a data set, the “additional information” must be “kept separately and subject to technical and organizational measures to ensure non-attribution to an identified or identifiable person.” Pseudonymisation is thus seen by the GDPR as a privacy-enhancing technique where directly identified data is held separately and securely from processed data in order to secure non-attribution. The GDPR sets new standards for Data protection by design and accountability. Organisations are required to adopt significant new technical and organisational measures to demonstrate their GDPR compliance.

Recital no. 26 states the following on pseudonymisation:

“The principles of data protection should apply to any information concerning an identified or identifiable natural person. Personal data, which have undergone pseudonymisation, which could be attributed to a natural person by the use of additional information, should be considered to be information on an identifiable natural person. To determine whether a natural person is identifiable, account should be taken of all the means reasonably likely to be used, such as singling out, either by the controller or by another person to identify the natural person directly or indirectly. To ascertain whether means are reasonably likely to be used to identify the natural person, account should be taken of all objective factors, such as the costs of and the amount of time required for identification, taking into consideration the available technology at the time of the processing and technological developments.”

Recital 26 states very clearly that pseudonymised data is **not** regarded as anonymous data according to the GDPR. Pseudonymised data and identifiable data are subject to the same levels of protection of the GDPR. Even though the Regulation can be said to encourage pseudonymisation of data, it is important to notice that pseudonymisation can be an unsecure method. When pseudonymisation is used, the data controller must ensure that the techniques chosen for pseudonymisation are on a sufficient level of security (Privacy by Design). Under these provisions, Article 6(4)(e) permits the processing of pseudonymised data for uses beyond the purpose for which the data was originally collected. Both Recital 78 and Article 25 list pseudonymisation as a method to show GDPR compliance with requirements such as Privacy by Design. These benefits could pave the way for pseudonymisation of personal data as an opportunity, at the same time achieve GDPR compliance and expand the uses of collected data.⁵³

Link to Technology law dispatch:

<https://www.technologylawdispatch.com/2017/11/privacy-data-protection/article-29-working-party-publishes-guidelines-on-personal-data-breach-notification/>

⁵³ Where to find in GDPR: Privacy by design: Article 25, Recitals 74-78, Pseudonymisation: Article 32, 1, a Recital 78

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It is definitely easier to use totally anonymised data when considering the requirements of the GDPR. According to Recital 26, the GDPR does not cover the use of completely anonymised data.

Data, which have been irreversibly anonymised, ceases to be “personal data”, and so it can be retained and used without having to comply with the Data Protection Acts. In principle, this means that organisations could use it for purposes beyond those for which it was originally obtained, and that it could be kept indefinitely, providing no other legal prohibitions.

In some cases, it is not possible to effectively anonymise data, either because of the nature or context of the data, or because of the use for which the data is collected and retained. Even in these circumstances, organisations might want to use anonymisation or pseudonymisation techniques:

1. As part of a "privacy by design" strategy to provide improved protection for data subjects.
2. As part of a risk minimisation strategy when sharing data with data processors or other data controllers.
3. To avoid inadvertent data breaches occurring when your staff is accessing personal data.
4. As part of a “data minimisation” strategy aimed at minimising the risks of a data breach for data subjects.

Even where anonymisation is undertaken, it does retain some inherent risk. As mentioned, pseudonymisation is not the same as anonymisation and should not be equated as such – the information remains personal data.

In the case of effective anonymisation take place, other legal regulation may apply – for instance the ePrivacy directive (Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications)). Even where effective anonymisation can be carried out, any release of datasets may have residual privacy implications. In this case the Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications) the expectations of the concerned individuals should be accounted for.

Following GDPR-Recitals regulate this issue:

(26): The principles of data protection should apply to any information concerning an identified or identifiable natural person. Personal data, which have undergone pseudonymisation, which could be attributed to a natural person by the use of additional information, should be considered to be information on an identifiable natural person. To determine whether a natural person is identifiable, account should be taken of all the means reasonably likely to be used, such as singling out, either by the controller or by another person to identify the natural person directly or indirectly. To ascertain whether means are reasonably likely to be used to identify the natural person, account should be taken of all objective factors, such as the costs of and the amount of time required for identification, taking into consideration the available technology at the time of the processing and technological developments. The principles of data protection should therefore not apply to anonymous information, namely information which does not relate to an identified or identifiable natural person or to personal data rendered anonymous in such a manner that the data subject is not or no longer identifiable. This Regulation does not therefore concern the processing of such anonymous information, including for statistical or research purposes.

(28) The application of pseudonymisation to personal data can reduce the risks to the data subjects concerned and help controllers and processors to meet their data-protection obligations. The explicit

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introduction of ‘pseudonymisation’ in this Regulation is not intended to preclude any other measures of data protection.

(29) In order to create incentives to apply pseudonymisation when processing personal data, measures of pseudonymisation should, whilst allowing general analysis, be possible within the same controller when that controller has taken technical and organisational measures necessary to ensure, for the processing concerned, that this Regulation is implemented, and that additional information for attributing the personal data to a specific data subject is kept separately. The controller processing the personal data should indicate the authorised persons within the same controller.⁵⁴

9.11 Implications for HBM4EU

Biological samples

Some of the projects carried out in HBM4EU will be based on either the use of biological samples collected in former projects (for instance DEMOCOPHES) and some will be based on the collection of new biological samples. It is therefore important to establish what status the Regulation gives the data derived from the use of biological samples:

1. What ethical requirements and legal regulations will apply to the use for research purposes of from already collected biological samples stored biorepositories?
2. What ethical requirements and legal regulations will apply to the use for research purposes of data derived from biological samples from already collected data repositories?
3. What ethical requirements and legal regulations will apply to new research projects in HBM4EU?

The Information Provision

HBM4EU will develop, in consultation with data protection officers and national Data Protection Supervisory Authorities, appropriate ways to inform data subjects about proposed processing, especially where the processing is secondary, compatible processing. This will be undertaken to ensure compliance with Articles 12, 13, and 14 of GDPR.

Data Subject Rights

HBM4EU will fully respect the rights of the data subjects (Art. 12 GDPR; as stated in Art. 15-23 GDPR), as far as they are available under the Regulation and under Member States’ use of the discretions made available by the Regulation particularly in relation to rights of access, correction of information, and the like. In order to ensure accurate conformity with the rights, HBM4EU will ensure its protocols are discussed fully with relevant national Data Protection Supervisory Authorities.

Recommendations GDPR: Protection of Personal Data

- Check recommendations, guidelines and forms on Data Collection, Data transfer from WP 10
- Include information and clauses on secondary use of data in research participant information and informed consent forms

⁵⁴ Relevant articles in the GDPR: Article 4: Definitions -1 personal data -5 pseudonymization

Article 5: Principles relating to processing of personal data, Article 6: Lawfulness of processing

Article 11: Processing which does not require identification, Article 25: Data protection by design and by default (Pseudonymisation), Article 32: Security of processing, Article 40: Codes of conduct

Article 89: Safeguards and derogations relating to processing for archiving purposes in the public interest, scientific or historical purposes or statistical purposes.

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- Include information and clauses on transfer of data to IPCHEM-database (HBM4EU Database in IPCHEM) in research participant information
- Data Transfer: Check your national Ethics Committee system/Data Protection Agency/Your own institution's Data Protection Officers guidelines for requirements/approvals
- Remember GDPR's recommendation on "Privacy by Design" - Consider requirements for common technical and governance-based procedures for:
 - Pseudonymisation
 - Data Transfers
 - Carrying out Data Protection Impact Assessments
 - Ledgers for data transactions

Recommendations: Obligations for data controllers in HBM4EU

In order to fulfil the obligations of the data controller:

- In the recruiting phase: Notify the research participants of the processing and the identity of the data controllers;
- That a risk analysis will be performed for the various processing undertaken in the project;
- That the supervisory authority will be notified as required;
- That local data protection officers will be involved in ensuring full compliance with data protection requirements;
- That ethics approval will be gained from the relevant ethics committees;
- That the processing of both existing as well as new data occurs in agreement with the relevant data controllers and the basis upon which they initially gathered personal data.

Recommendations: HBM4EU and Data Protection by Design

HBM4EU, in designing its protocols, is seeking to ensure "Data Protection by Design" (Art. 25 of GDPR). Whereas many principles are clear in the new Regulation, and, indeed, are very similar to the requirements of Member States' domestic law under Directive 95/46/EC, other parts remain unclear (as indicated above). The drafting of the specific protocols for HBM4EU research will ensure:

- clear and transparent explanations of defined purposes for the processing of personal data;
- pseudonymised data processing - with the highest security practice being used to ensure the minimisation of accidental or deliberate re-identification of participants in breach of the agreed purposes of the research and under the terms of the route to lawful processing used to gather the data initially;
- only personal data necessary for HBM4EU will be processed in the project, and it will be kept securely;
- informed consent will be used; where already gathered data are used, and the initial route by which those data were gathered was not informed consent, the data subjects will be re-consented unless there is agreement from the research ethics committees and the national Data Protection Supervisory Authorities agree that this is a lawful, fair and transparent processing; and,
- data subjects will be informed about the nature of any processing and the identity and contact details of the data controllers.

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10 HBM4EU and Biobanks

10.1 Defining Biobanks

According to Robert Hewitt and Peter Watson⁵⁵ the term “biobank” first appeared in the scientific literature in 1996 and for the next five years was used mainly to describe human population-based biobanks. In recent years, the term has been used in a more general sense and there are currently many different definitions to be found in reports, guidelines and regulatory documents. In order to gauge the opinions of people involved in managing sample collections of all types, the authors conducted a survey. The survey was conducted using an online questionnaire that attracted 303 responses. The authors conclude

“...that the results of the survey show that there is consensus that the term biobank may be applied to biological collections of human, animal, plant or microbial samples; and that the term biobank should only be applied to sample collections with associated sample data, and to collections that are managed according to professional standards.”

According to the WMA’s Declaration of Taipei on Ethical Considerations Regarding Health Databases and Biobanks⁵⁶, a health database is a system for collecting, organizing and storing health information. A Biobank is a collection of biological material and associated data. Biological material refers to a sample obtained from an individual human being, living or deceased, which can provide biological information, including genetic information, about that individual. The declaration stresses that health databases and biobanks are both collections on individuals and population, and both types of collections give rise to similar concerns about dignity, autonomy, privacy, confidentiality and discrimination.

10.2 Biobanks and the legal landscape

The biobank area is regulated by international, EU and national regulation. The regulatory picture encompassing biobanks may appear very fragmented and offers a varied landscape of different regulatory models in the different countries.

During the last 40 years, a set of shared ethics and legal principles has been developed setting standards for the area of health research involving human individuals and biological samples of human origin and data derived from these. These standards can be found in international, EU- and national legislation and in professional guidelines.

The ethics and legal principles of dignity, autonomy, privacy, confidentiality and non-discrimination are mirrored in the international and national regulation and guidelines on ethics evaluation of biomedical research on human individuals and in the EU regulation 2016/679 (GDPR) on protection of personal data⁵⁷.

It has for some time been sufficient for each country to take its own stand in different issues involving ethics, legislation and governance regarding biobanking. Today developments in relation to the

⁵⁵ Robert Hewitt and Peter Watson, ‘Defining Biobank’, *Biopreservation and Biobanking*, 11.5 (2013), 309–15
<<https://doi.org/10.1089/bio.2013.0042>>.

⁵⁶ ‘WMA - The World Medical Association-WMA Declaration of Taipei on Ethical Considerations Regarding Health Databases and Biobanks’ <<https://www.wma.net/policies-post/wma-declaration-of-taipei-on-ethical-considerations-regarding-health-databases-and-biobanks/>> [accessed 11 November 2017].

⁵⁷ *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the Protection of Natural Persons with Regard to the Processing of Personal Data and on the Free Movement of Such Data, and Repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA Relevance)*, CXIX.

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internationalisation of data-sharing, and the sharing of biological samples and information created from research on human biological material create more detailed demands in terms of regulation, administration and governance. The international and national legal decision-makers now face the difficulties of balancing the ethics principles of the freedom and rights of individuals and vulnerable groups against the societal needs and ambitions of enhancing scientific and economic development within new biotechnological advancements.

The legal area of biobanking is characterized by a varied range of legal tools consisting of different regulatory instruments, from hard law instruments to soft law instruments: EU binding regulation, directly applicable in all the member states (for example the GDPR), international conventions (for example The Bioethics Convention⁵⁸, and recommendations on biobanking of the European Council, UNESCO Declaration on the Human Genome and Human Rights and the WMA declaration of Helsinki. The aim of the international declarations is to protect human dignity, human rights and set out standards and principles for the national actors defining EU- and national legislation in the area of storage and use of biological samples.

GDPR and Biobanks

The analysis of research ethics and the research persons' rights in relation to informed consent is as important as the examination of the impact of the GDPR and its ramifications of biobanking and health research.

It is our interpretation that Recital 34 of GDPR excludes the biological sample from the remit of GDPR: "*Genetic data should be defined as personal data relating to the inherited or acquired genetic characteristics of a natural person which result from the analysis of a biological sample from the natural person in question, in particular chromosomal, deoxyribonucleic acid (DNA) or ribonucleic acid (RNA) analysis, or from the analysis of another element enabling equivalent information to be obtained.*" The regulation on collecting, handling, storing and use of the biological samples is not regulated by GDPR, but the "dry data" derived from the analyses of the biological samples are covered by GDPR.

10.3 The use of Biobanks in HBM4EU

Many biobanks store valuable samples for analysis and when such sources have been identified full compliance with the Data Management Plan should be ensured.

It must be expected that a large number of the research projects in HBM4EU will be carried out from analyses of biological samples stored in existing biobanks or from biological samples to be collected, processed and stored in future biorepositories and biobanks created by research projects carried out under the auspices of HBM4EU. The HBM4EU Grant Agreement stipulates that the biological samples and the data derived from these used in the HBM4EU projects are to be transferred to a common HBM4EU repository with the expectation of future transfer to the Commission's database IPCHEM. This makes the issues of bioethics and data ethics related to the collection, storing, processing, use and sharing of biological samples and data derived from these and the transfer and sharing of materials and data from existing biobanks important to identify. The following chapter gives a description of these issues.

⁵⁸ 'CETS 164 - Convention for the Protection of Human Rights and Dignity of the Human Being with Regard to the Application of Biology and Medicine: Convention on Human Rights and Biomedicine - 168007cf98' <<https://rm.coe.int/168007cf98>> [accessed 4 January 2018].

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Material transfer agreements are set in place for transfer within HBM4EU in WP7 ensuring ethics approval of secondary use of samples. Human samples may also be collected and/or exchanged in the development of new analytical methods where the ethics described in section 5.1.2 apply.

The HBM4EU studies will have to have extra focus on how to handle the ethics requirements in relation to the storage and sharing of biological samples and the collection, storing and sharing of the data derived from the biological samples. Material Transfer Agreements have been developed.

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11 Genetic testing

General reference can be made to the ‘Additional Protocol to the Convention on Human Rights and Biomedicine concerning Genetic Testing for Health Purposes’ by the European Council. The Protocol sets down principles relating inter alia to the quality of genetic services, prior information and consent and genetic counselling. It lays down general rules on the conduct of genetic tests, and, for the first time at international level, deals with the directly accessible genetic tests for which a commercial offer could develop in future. It specifies the conditions in which tests may be carried out on persons not able to consent. Also covered are the protection of private life and the right to information collected through genetic testing. Finally, the Protocol touches on genetic screening⁵⁹. National legislation also regulates genetic testing and screening.

Genetic data contain unique information about the person regarded as a research participant and regarded as a data-subject in the light of GDPR. Furthermore, genetic data will also contain unique information about the person’s blood relatives, thus highlighting the importance of setting up necessary privacy protection measures, when processing genetic data.

UNESCO’s International Declaration on Human Genetic Data from 2003 elaborates the recommendations on human genetic data found in UNESCO’s Universal Declaration on Human Genome and Human Rights from 1997. These declarations have contributed to forming the legal instruments at the EU level setting the legal framework for protecting the privacy of the individual person.

Nuffield Council of Ethics Recommendations

The Nuffield Council of Ethics in 1993⁶⁰ recommended that participation in all screening programmes should only be on a voluntary basis and that adequate informed consent must be obtained from participants. It also recommended that counselling should be readily available for those being screened, as well as for those being tested on account of a family history of a genetic disorder. The Council recognized that the results of screening might have serious implications for members of a family. When genetic screening reveals information that might have implications for the relatives of the person being screened, the report recommended that health professionals should explain why the information should be communicated to other family members. They should then seek to persuade individuals, if persuasion should be necessary, to allow the disclosure of relevant genetic information to other family members who might benefit from it. Where a screened individual did not wish to inform relatives of a genetic risk or to give permission for test results to be used by them, the Council accepted that under exceptional circumstances it may be appropriate to disclose genetic results ‘without consent’ to benefit family members. The legal interpretation would be that there is an exception to the duty of confidentiality where the disclosure is in the public interest.

The report also considered implications for employment and insurance, proposing early discussions between government and the insurance industry about the future use of genetic data. In our view, screening in the context of employment should be strictly limited and only be undertaken if accompanied by safeguards for employees after appropriate consultation.

⁵⁹ <http://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/203>

⁶⁰ <https://nuffieldbioethics.org/wp-content/uploads/2014/07/Genetic-Screening-a-Supplement-to-the-1993-Report-2006.pdf>

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EU Regulation on Access and Benefit Sharing (ABS)

HBM4EU follows the EU Regulation on Access and Benefit Sharing (ABS)⁶¹. In relation to genetic resources and the fair and equitable sharing of benefits arising from their utilization, each partner has to consider the involvement of genetic resources or traditional knowledge associated with genetic resources. Exercising due diligence is the core obligation under the ABS regulation.

For multi-beneficiary grants, the project coordinator may make a single declaration. Alternatively, each beneficiary whose activities fall within the scope the EU ABS Regulation must make an individual declaration. The declaration must be made at the latest by the end of the project (final report).

HBM4EU will consider utilisation of genetic resources at a later stage when more details on protocols are available. The assessment of whether a project falls within the scope of the EU ABS Regulation must be performed by each data provider.

Genetic data and GDPR

The General Data Protection Regulation from 2016 sets up specific regulation for genetic data. The Regulation has maintained the key definitions of personal data from the former directive 95/46/EC, defining personal data as “any information related to an identified or identifiable natural person (data subject)”. The GDPR includes the word “genetic” in Article 4.1. The term “genetic” was not included in the former directives definition of personal data. GDPR has deemed certain categories of data as sensitive, including genetic data.

According to Recital 51: “*Personal data which are, by their nature, particularly sensitive in relation to fundamental rights and freedoms merit specific protection as the context of their processing could create significant risks to the fundamental rights and freedoms.*”

Sensitive personal data is a specific set of “special categories” that must be treated with extra security. These categories are: racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership **genetic data and biometric data**.

The GDPR introduces the concept of privacy by design, especially including the technique of pseudonymisation as a means of protecting sensitive personal data. Pseudonymised data are regarded by the Regulation as identifiable and will fall within the scope of the remit of GDPR.

Insurance – Genetic testing

The ‘Recommendation’ by Council of Europe⁶² sets out essential principles aimed at protecting the rights of persons whose personal data are processed for insurance purposes. It considers insurance companies’ legitimate interest in assessing the level of risk presented by the insured person. The recommended measures include strict safeguards for the collection and processing of health-related personal data, based on the insured person’s consent, as well as the prohibition of requiring genetic tests for insurance purposes.

As a first international legal instrument in this field, the Recommendation notably aims at preventing any processing of health-related data, which would not be justified and would not comply with the criteria of relevance and validity.

⁶¹ Regulation (EU) No 511/2014 of the European Parliament and of the Council of 16 April 2014 on compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the Union <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014R0511>

⁶² Council of Europe calls on member states to ban genetic tests for insurance purposes - and better protect health-related and genetic data processed by insurance companies <http://www.coe.int/en/web/bioethics/genetics>

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The text also underlines the necessity of facilitating access to insurance, under affordable conditions, to persons presenting an increased health risk, and the importance of promoting fair and objective settlement of disputes between insured persons and insurers.

Genetic testing and Occupational health

Genetic testing in the workplace holds the promise of improving worker health but also raises ethical, legal, and social issues. In considering such testing, it is critical to understand the perspectives of workers, who are most directly affected by it, and occupational health professionals, who are often directly involved in its implementation. Therefore, a series of focus groups of unionized workers (n=25) and occupational medicine physicians (n=23) was conducted. The results demonstrated strikingly different perspectives of workers and physicians in several key areas, including the goals and appropriateness of genetic testing, and methods to minimize its risks. In general, workers were guided by a profound mistrust of the employer, physician, and government, while physicians were guided primarily by scientific and medical concerns, and, in many cases, by the business concerns distrusted by the workers.⁶³

Reflections in relation to Genetic data

These issues are discussed in the publication “Rules for processing genetic data for research purposes in view of the new EU General Data Protection Regulation by Mahsa Shabani and Pascal Borry.⁶⁴

The authors mention 3 main points of concern in relation to GDPR:

1. The definition of pseudonymised data leaves room for further interpretation on what are the sufficient methods of pseudonymisation and when data are considered fully non-identifiable
2. The room for Member States to set further limitations on processing genetic data for research purposes may hamper cross-border processing of genetic data and undermine harmonization of data protection within the EU, if those limitations and conditions vary.
3. GDPR emphasized pseudonymisation as a safeguard when processing data under research exemption. Other safeguards, such as organizational measures and oversight by competent bodies, should be further utilized as they may better suit to the purpose of governance of research at times.”⁶⁵

When including Genetic data in coming research projects, it will be necessary for HBM4EU to consider how to implement the requirements of GDPR in relation to protecting sensitive data:

- Which techniques for pseudonymisation will be adequate to comply with the demands of GDPR in order to create ‘privacy by design’?
- How to establish common guidelines for transfer of biological samples?
- How to establish common guidelines for transfer of data among researchers within HBM4EU and transfer of data to EU repositories and databases such as HBM4EU repositories and IPCHEM?

⁶³ Brandt-Rauf SI, Brandt-Rauf E, Gershon R, Brandt-Rauf PW. The differing perspectives of workers and occupational medicine physicians on the ethical, legal and social issues of genetic testing in the workplace. *New Solut.* 2011;21(1):89-102. doi: 10.2190/NS.21.1.j.

⁶⁴ Mahsa Shabani and Pascal Borry, ‘Rules for Processing Genetic Data for Research Purposes in View of the New EU General Data Protection Regulation’, *European Journal of Human Genetics*, 26.2 (2018), 149–56 <<https://doi.org/10.1038/s41431-017-0045-7>>.

⁶⁵ Mahsa Shabani and Pascal Borry, ‘Rules for Processing Genetic Data for Research Purposes in View of the New EU General Data Protection Regulation’, *European Journal of Human Genetics*, 26.2 (2018), 149–56 (p. 155) <<https://doi.org/10.1038/s41431-017-0045-7>>.

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- How to establish common guidelines and organizational safeguards for carrying out DPIAs (Data Protection Impact Assessments) and other risk analyses in order to comply with the requirements of GDPR for processing sensitive data
- How to establish common guidelines for handling biologicals samples and biorepositories - considering the fact that the biological samples are mainly subject to national legislation?

Recommendations Genetic Data

- HBM4EU has to identify issues of genetic testing in the program and address the potential benefit and harm to study persons in participating. Special issues of information and informed consent as well as being informed about individual results must be addressed.
- Check for any National organisational measures and oversight by competent bodies
- Biological samples are subject to national legislation – check national legislation on collection, handling, storing, and using biological samples (i.e. legislation regarding biobanks)
- Get ethics permits from national research ethics committee
- Comply with HBM4EU and own organisation's guidelines for carrying out risk assessments according to GDPR (DPIA -Data Protection Impact Analysis)
- Comply with WP10 Guidelines for Data transfer Agreements
- Comply with WP10 Guidelines for Material Transfer Agreements
- Occupational Health: Consider special safeguards regarding confidentiality and privacy in relation to genetic research in occupational health (to protect research participants rights in relation to health insurance rights)

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12 Socio-economic information

Information of socioeconomic status from routine systems can create sensitive information. An example of this is information on stillbirths and socioeconomic status.

Data on stillbirths and socioeconomic status from routine systems showed widespread and consistent socioeconomic inequalities in stillbirth rates in Europe⁶⁶.

The GerES has reported associations of environmental exposures and low socioeconomic status SES⁶⁷.

A Flemish study⁶⁸ investigated the associations between individual socioeconomic status (SES), measured by parental educational attainments, and internal body concentration of seven chemical compounds in biological samples of 1642 adolescents aged 14–15 in Flanders (Belgium): PCBs, HCB, DDE, lead, cadmium, benzene and PAHs. Social gradients in average and high exposure to these biomarkers were examined with geometric means and odds ratios (with 95% confidence intervals), using multiple regression models, controlling for covariates and confounders. Depending on the (type of) pollutant, adolescents with a lower SES either have higher or lower internal concentrations. Chlorinated compounds (PCBs and pesticides HCB and DDE) are positively associated with SES (higher exposures for higher SES), while heavy metals (lead and cadmium) are negatively associated (higher exposures for lower SES). For metabolites of organic compounds (benzene and PAHs) no association with SES was found. Socially constructed factors, such as dietary and lifestyle habits, play an important role in these relations. The study suggests that the association between individual SES and the internal body concentration of exposure to environmental pollutants in Flemish adolescents is more complex than can be assumed on the basis of the environmental justice hypothesis.

A schematic overview by Dahlgren and Whitehead, is shown below of the range of factors that can contribute causally, or in modifying form, to the variation in people's health⁶⁹. When designing questionnaires these variables must be taken into consideration.

⁶⁶ Zeitlin J, Mortensen L, Prunet C, Macfarlane A, Hindori-Mohangoo AD, Gissler M, Szamotulska K, van der Pal K, Bolumar F, Andersen AM, Ólafsdóttir HS, Zhang WH, Blondel B, Alexander S; Euro-Peristat Scientific Committee. Socioeconomic inequalities in stillbirth rates in Europe: measuring the gap using routine data from the Euro-Peristat Project. *BMC Pregnancy Childbirth*. 2016 Jan 19;16(1):15

⁶⁷ Conrad A et al The German Environmental Survey for Children (GerES IV): Reference values and distributions for time-location patterns of German children *Int J Hyg Environ Health*. 2013

⁶⁸ Morrens B, Bruckers L, Den Hond E, Nelen V, Schoeters G, Baeyens W, Van Larebek N, Keune H, Bilau M, Loots I: Social distribution of internal exposure to environmental pollution in Flemish adolescents. *International Journal of Hygiene and Environmental Health* 215 (2012) 474– 481

⁶⁹ Originally published in: Dahlgren G and Whitehead M (1991) *Policies and Strategies to Promote Social Equity in Health* (Stockholm: Institute of Futures Studies); Reproduced from: Acheson D (1998) *Independent Inquiry into Inequalities in Health Report*,⁶⁹ Galobardes, Bruna, Mary Shaw, Debbie A Lawdor, John W. Lynch, and George Davie Smith: "Indicators of socioeconomic position (part 1)". *Journal of Epidemiology and Community Health* 60, 1 (2006): 7

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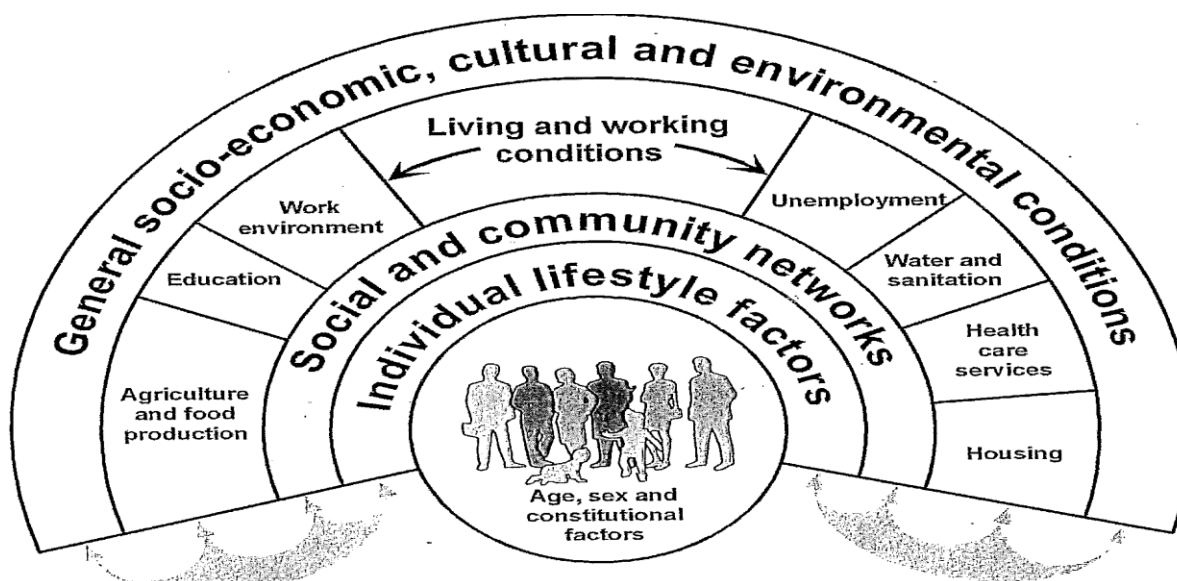


Figure 3: Range of factors contributing to variation in people's health (Dahlgren and Whithead, 1991)

12.1 Socio-Economic Screening and HBM4EU the ethics approval

The screening with respect to psychological or socio-economic information that will be retrieved of the respondents within the questionnaires of HBM4EU or its related surveys can be incorporated and covered by the medical/bioethical procedure. It might be good to keep in mind that in case of surveys for consultation or the organization of focus groups with citizens (outside the HBM-survey but within the HBM4EU-project), the ethical clearance of an Ethics Committee Social Sciences and Humanities might apply.

This committee will be consulted when involving human participants in surveys, interviews, observations, (intentional) deliberate deception or case studies are set up where there is possible (physical, psychological or social) risk for the participants, a risk of privacy/data or damage to the public or personal reputation of the people involved. A flow chart and an overview are given in ⁷⁰, and ⁷¹.

In most cases, it suffices to demonstrate how these situations are avoided and protection of the participants is taken care of in the design and methodology part of the research report. These procedures seldom facilitate (structure for) collective ethical reflection. Suggested alternative or complementary initiatives are community advisory boards, patient advisory boards etc. Research integrity also refers to the socio-ethical responsibilities researchers have towards society. These responsibilities result from the impact science and innovation can have on society. Through Pathways to Impact⁷², the research council of the UK for instance encourages researchers to explore—from the outset, throughout the course of their projects, and beyond—who could potentially benefit from their research and what they can do to help make this happen (RRI-website, www.rri-

⁷⁰ UAntwerpen, Guidelines to determine the need for ethics approval.

⁷¹ The National Committee for Research Ethics in the Social Sciences and the Humanities (NESH) (2006): *Guidelines for research ethics in the social sciences, law and the humanities*. Oslo: The Norwegian National Research Ethics Committees and at the website <https://www.etikkom.no/en/library/introduction/an-introduction-to-research-ethics/the-social-sciences-the-humanities-law-and-theology/>

⁷² <https://www.ukri.org/innovation/excellence-with-impact/pathways-to-impact/>

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tools.eu). Also, the RESPECT-code of practice is a general reference, with a chapter on the avoidance of social and personal harm⁷³

Examples of indicators of socioeconomic factors to be taken into account are shown in figure 4.

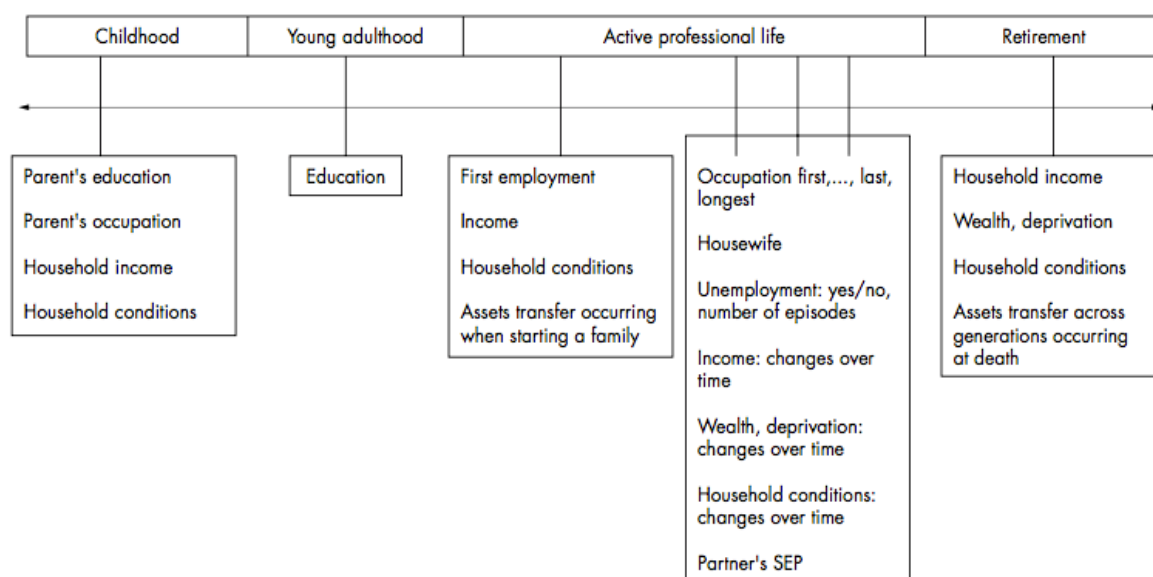


Figure 1 Examples of indicators measuring life course socioeconomic position.

Figure 4: Examples of indicators measuring life course socioeconomic position, from Galobardes et al (2006)⁷⁴.

Recommendations Socio-economic information

- Ensure that research participants are protected from undue intrusion, distress, indignity, physical discomfort, personal embarrassment or psychological or other harm.
- Ensure that the research process does not involve unwarranted material gain or loss for any participant.
- Ensure that research results are disseminated in a manner that makes them accessible to the relevant social stakeholders.
- Ensure that research is commissioned and conducted with respect for all groups in society regardless of race, ethnicity, religion and culture, and with respect for and awareness of gender or other significant social differences.

⁷³ The RESPECT Code of Practice <http://www.respectproject.org/code/charm.php?id=>

⁷⁴ Galobardes,B, Shaw M, Lawlor DA, Lynch JF, Davey Smith G. Indicators of socioeconomic position (part 1) J Epidemiol Community Health. 2006: 60(1):7-12

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13 Children

Children are not small adults in relation to exposure and susceptibility. Rapid growth, development, and anatomical and physiological changes in various organs and organ systems differentiate children from adults in relation to exposure and susceptibility to environmental exposures. The unborn child and breastfed children may be exposed to environmental pollutants that depend on the maternal exposures. Also, children are exposed to different levels of environmental agents because of the size and developmental stage. Children may experience different sources of exposure because of behaviour, for example, eating sand from a sandpit, exposure to dust while crawling on the floor. Moreover, children have a longer life span in which to express illness. Second, children are particularly dependent on their environment and on their caregivers to make the right decisions for them. Their ability of making independent decisions and given their consent to participate in research depends on their age, may differ from adults, and their consent to participate may be reassessed as they grow (Knudsen et al 2016). Figure 5 illustrates steps and stakeholders involved.

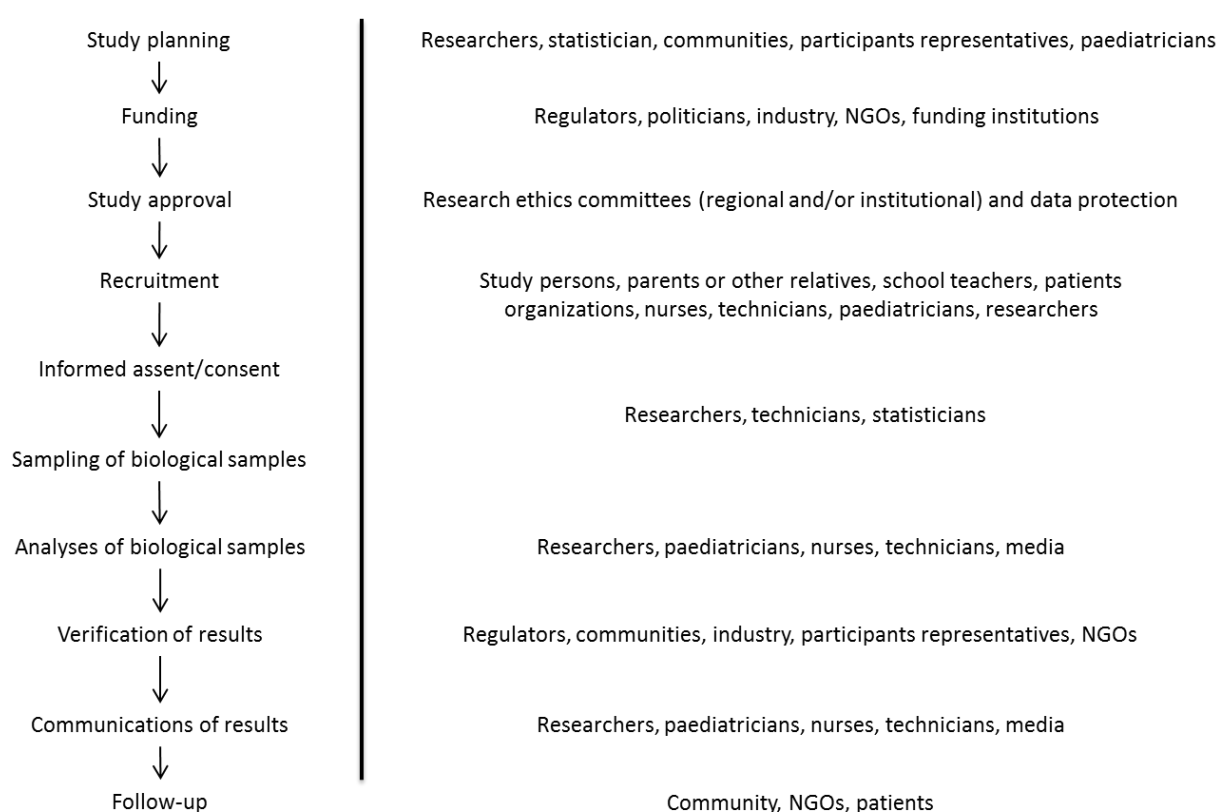


Figure 5. Ethical considerations may be raised at different critical steps of human biomonitoring of children, by various groups of stakeholders (from Knudsen et al 2016).⁷⁵

13.1 Ethical and legal considerations with regard to children participating in human biomonitoring

Children's rights in research participation are governed by ethical and legal considerations. As mentioned above, children are considered to be a vulnerable group in relation to research activities and this group is therefore subject to special measures of protection in relation to research.

⁷⁵ Knudsen LE, Hansen PW, Pedersen M, Merlo FD. Environmental Health Ethics in Study of Children. Reference Module in Earth Systems and Environmental Science 2016. ed. / Scott A. Elias. 2017. p. 400-409.

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Children's participation rights are stated in the United Nations Convention of the Rights of the Child (CRC)⁷⁶. Article 12 gives the child the right to express its opinions freely and have these respected and taken into account in matters that affect the child. The Helsinki Declaration, the bioethics convention and the additional protocol on research all mention the principle of minimal risk and burden in relation to carrying out research on persons not able to consent. Ensuring children's safety in research participation also requires approval from an ethics committee.

The rights of the child in the Bioethics Convention, the GDPR and in other international and national regulation require researchers to give information to the child specially designed to be accessible to the child according to the child's level of maturity and understanding.

When including children, the principle of informed consent by proxy (usually the parent(s)) must be adhered to. An age stage developmental perspective on childhood means that even though parental consent has been obtained by the researcher, it is necessary for the researcher to obtain the informed assent of the child. In this context, special attention and care must be given to the development of information material and assent forms the age and the maturity of the child.

In sociological studies there are developments towards viewing the child as an individual capable of making its own decisions about participation in research⁷⁷. In the article "The Ethics of Participatory Research with children" the authors highlight *the active agreement of the child to participate, the right of the child to withdraw from participation at any time*. The third principle mentioned by the authors is to offer the children *"as much choice as possible over how they participated in the research, consistent with our remaining true to the objectives of the study and our obligations to our sponsors. This implied offering children some choice over the research instruments and allowing them to some extent to direct the course of their 'interviews', within the overall themes of the research."* In relation to HBM studies the third principle might not be directly applicable, but the guiding principle of a general child-centred perspective should be considered.

Informed assent

Informed assent: Children, especially unborn, new-born, and very young, are clearly unable to consent for research by themselves. Hence, they are dependent on the decisions of their parents or of other legal guardians. Even older children, who can already express their own opinions, are naturally influenced by the people they trust the most.

Obtaining informed consent from a child, according to the available guidelines, involves necessarily the child's assent and parental (or legal guardian's) consent (proxy consent). In the case of very young children who are unable to assent, parental consent is of course needed in the child's best interest. This means that there is a consensus agreement that a 'consent dyad' is required to conduct research on children. This is a challenge for researchers, who are responsible for ensuring informed consent.

Informed assent means a child's agreement (acquiescence) to research procedures in circumstances where he or she is not legally authorized or lacks sufficient understanding for giving consent competently. When the blood sampling involves a child aged 7 years or older, permission must be obtained from the parent or legal representative and assent must be obtained from the child. Each institution (hospital, university, etc.) has its own responsibility to determine the necessity of

⁷⁶ 'OHCHR | Convention on the Rights of the Child' <<http://www.ohchr.org/EN/ProfessionalInterest/Pages/CRC.aspx>> [accessed 15 May 2018].

⁷⁷ Nigel Thomas and Claire O'Kane, 'The Ethics of Participatory Research with Children', *Children & Society*, 12.5 (1998), 336–48 <<https://doi.org/10.1111/j.1099-0860.1998.tb00090.x>>.

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obtaining assent from these children. The regulations also state that age, maturity, and psychological state should be considered in the determination of whether children are capable of assenting to the medical procedure sent should include the following elements:

- Helping the patient (child) achieve a developmentally appropriate awareness of the nature of his/her condition.
- Telling the patient what he or she can expect with tests and treatment(s).
- Making a clinical assessment of the patient's understanding of the situation and the factors influencing how he or she is responding.
- Soliciting an expression of the patient's willingness to accept the proposed care. Regarding this final point, note that no one should solicit a patient's view without intending to weigh it seriously.

In **social science and humanities research**, there may be situations where standard procedures for obtaining written informed consent are harmful or offensive to the participants (rather than affording them protection). In such cases, explain how alternative consent will be gained (e.g. orally). If deception is to be used, retrospective informed consent should be obtained and participants must be debriefed. Deception requires strong justification and appropriate assessment of the impact and the risk incurred by both researchers and participants.

Some countries have specific national requirements to be further resolved and the partner in HBM4EU providing the data are obliged to fulfil these. Consultation of local legal and ethics expertise may be necessary and the partner has to identify such expertise and inform the HBM4EU coordination team.

Rights of young persons (age 15-17) participating in research projects

In some national legislation (for example the Danish legislation), young persons between 15-17 years are granted extended information and rights to assent in relation to participating in a research project. If a 15-17-year-old research participant wishes, the young person must receive written information about the project. Both the oral and written information must be adapted to the age and maturity of the young person. The information must be based on the information to the parents. The trial protocol should be enclosed.

Rights of research participants reaching the age of majority

In HBM, some projects will include studies of mothers and children. In order to give the child the right to withdraw from participation when reaching the age of majority, it will be important to design the consent forms in order for a special consent form for the child participating in the research project to be developed. This consent form must be signed by the parents or parent according to the requirements of national law. By creating a special consent form for the participating child, it will be possible to identify the child's participation thus giving the child the possibility to enforce the rights of persons participating in research and the rights of persons as data subjects according to GDPR-when the child reaches the age of majority.

Recommendations for HBM4EU in relation to Children

- The person responsible of informing the child or the young person about participation must be able to communicate information about and implications of the research project to the child according to the age and maturity of the child.
- Older children should be included in the information-process about the research project, to the extent that the child or the young person will be able to understand the implications of the research project. This information-process must therefore be adapted to the child's ability of understanding. The child's or the young person's own decision must be taken into

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account when applicable and relevant. Protest also means resistance which is not formulated orally but which is expressed by the child's attitude, body language or resistance to physical intervention. Consent from the parents should not imply that an intervention can be made against the will of the child.

- If a 15-17-year-old research participant wishes, the young person must receive written information about the project. Both the oral and written information must be adapted to the age and maturity of the young person. The information must be based on the information to the parents. The research protocol should be enclosed for the information of the 15-17-year-old person.

13.2 Mother Child cohorts (Cord blood and placenta)

Many mother child cohorts collect cord blood and placenta along with establishing biobanks for research and/or treatment.

The issues of collection, storage, and use of cord blood (CB) stem cells have been addressed extensively in national and international guidelines, policies, and regulations. Many of these documents are not binding, but are nonetheless accorded considerable respect on account of the authority of the issuing organizations. Most discussion has - to this date - focused on two topics: informed consent for collection, banking and use, and the debate between those who favour public storage for altruistic purposes and those who advocate private storage for autologous use. There is generally agreement or consensus in the guidelines that public storage for allogeneic transplants is preferable and that private storage should be discouraged. Given the consensus in national and international guidance on these two issues, it is time for other ethical issues to be examined in greater detail. These include additional uses of CB samples, for example, for research or for the production of blood-derived drugs, and the economic implications arising from the extensive international network for the exchange of CB for transplantation⁷⁸.

Recommendations: Mother Child cohorts (Cord blood and placenta)

- The informed consent is critical and thus for use of CB samples and placenta tissue documents related to information of donors and the informed consent form must be provided. Transfer agreements are needed in case samples are transferred between laboratories.
- In the case of mother child cohorts established for environmental health studies, reference should be made to existing cohorts and their transfer conditions of samples and data respecting the informed consent and data protection.

⁷⁸ Petrini C. Ethical issues in umbilical cord blood banking: a comparative analysis of documents from national and international institutions. *Transfusion*. 2013 Apr;53(4):902-10

14 Occupational Health Studies

The International Code of Ethics for Occupational Health Professionals published by the International Commission on Occupational Health (ICOH) presents the ethical principles essential in occupational health. The Code is intended to guide all professionals who carry out occupational health activities and to set a generally valid reference level in their performance⁷⁹. Manno et al 2014⁸⁰ have summarised the specific case for HBM and occupational health (see figure 6).

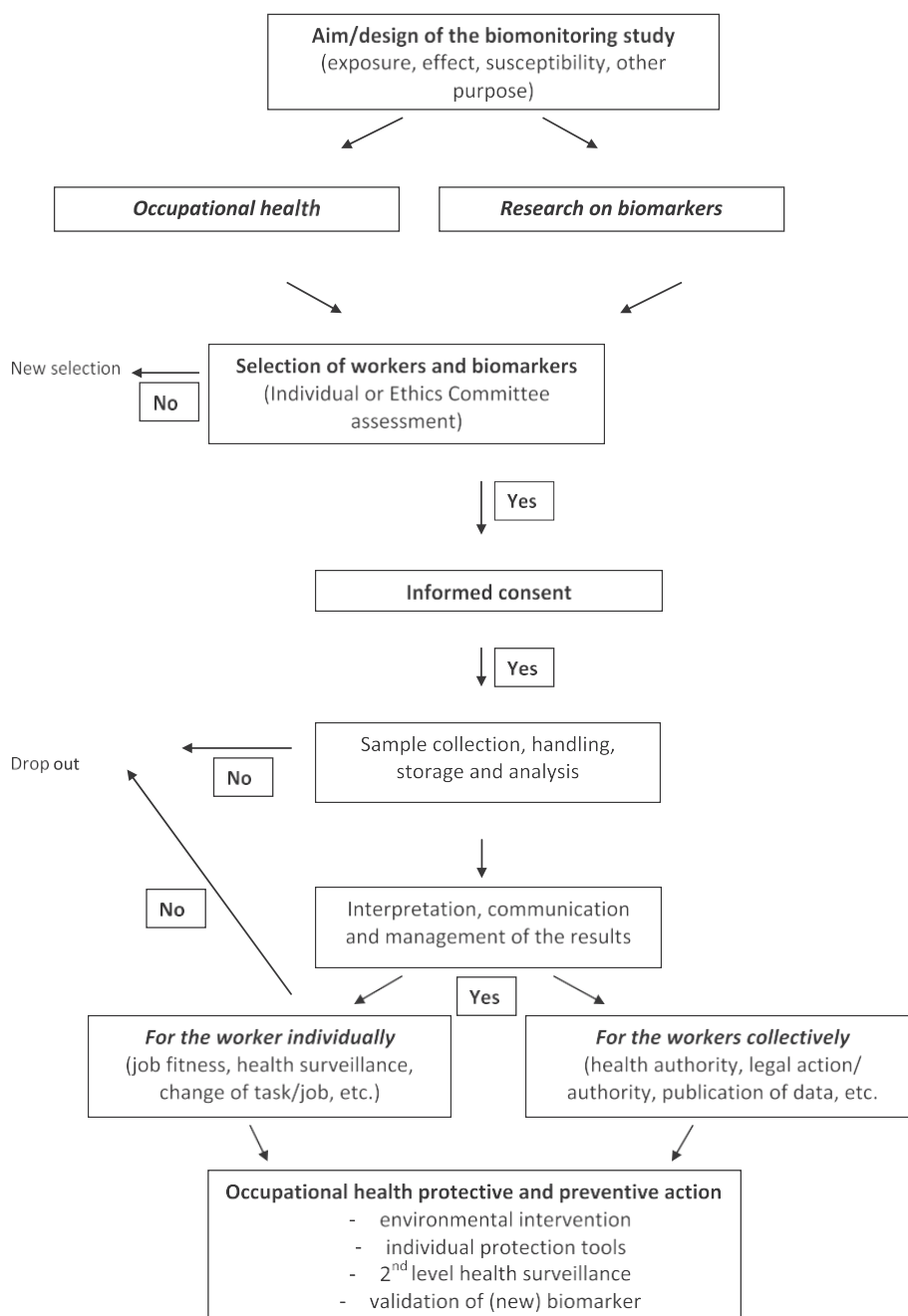


Figure 6. Phases of a biological monitoring program requiring ethical assessment. The decision on whether the priority is purely occupational health or (also) research/validation of new biomarkers is to be taken early and stated clearly in the process. “Yes” and “no” refer to positive and negative ethical outcome, respectively. From Manno et al 2014.

⁷⁹ http://www.icohweb.org/site_new/multimedia/core_documents/pdf/code_ethics_eng_2012.pdf

⁸⁰ Manno et al (2014): Ethics in Biomonitoring for occupational health. *Toxicology Letters* 231 111-121

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In relation to occupational studies, the employees are candidates for participating in HBM studies. In this case, the project participant is in a more vulnerable position than that of a project participant recruited outside the person's workplace. The employee might feel obligated to participate, if the employer finds the project of importance to the company.

When recruiting project participants at their place of employment, special considerations and safeguards need to be taken in order to avoid undue duress in the recruiting procedure. Also, special safeguards in relation to the protection of sensitive data needs to be taken in order to safeguard sensitive data from unauthorized use by the company.

When determining the format for informing the companies/employers in relation to recruiting research participants in HBM studies, it is important to understand the different contractual nature of the assent of the employer/company. Both with regards to inviting the researcher to carry out the research at the company, as well as for the recruitment and information and procedure targeted to the employees (the prospect research participants).

Giving employers/companies the same status as research participants (i.e.: participants' information for employers and informed consent form for employers) would give the companies "undue influence over the employees". For example, by giving the company/employer the right to withdraw from participating in a HBM-project. That would be an act overruling the decisions of the actual project participants. The ethical guidelines of ICOH voices consideration in relation to including research participants in occupational studies⁸¹.

The ICOH guidelines states the following on research participation contribution to scientific knowledge:

15. Occupational health professionals must report objectively to the scientific community as well as to the public health and labour authorities on new or suspected occupational hazards. They must also report on new and relevant preventive methods. Occupational health professionals involved in research must design and carry out their activities on a sound scientific basis with full professional independence and follow the ethical principles relevant to health and medical research work. These include social and scientific value, scientific validity, fair subject selection, favourable risk benefit ratio, informed consent, respect for potential and enrolled subjects, review of protocols and potential conflicts of interest by an independent and competent ethics committee and protection of confidential data. The occupational health professionals have a duty to make their research results publicly available. They are accountable for the accuracy of their reports.

As seen above, the relation between the researcher and the company in occupational health studies is not of the same nature as the relation between the researcher and the research participant, mainly because the company as such cannot be considered to be a research subject. Therefore, the format and contractual relation between the researcher and the company/employer in relation to occupational health studies represents a different set of values than the one involving the relationship between the researcher and the research participant. The agreement between the researcher and the company/employer needs to be reformulated with a different set of rights for participation of the employer/company securing the rights of the employees as project participants and as data subjects.

⁸¹ 'International Commission on Occupat - 1993 - INTERNATIONAL CODE OF ETHICS FOR OCCUPATIONAL HEAL.Pdf' <http://www.icohweb.org/site/multimedia/code_of_ethics/code-of-ethics-en.pdf> [accessed 22 May 2018].

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Guidelines for HBM in occupational health studies should be developed as part of this initiative in HBM4EU when developing new guidelines. The guidelines from “Priorities for Occupational Safety and Health Research in Europe: 2013-2020” should be considered. The set of guidelines especially voices the need for:

More toxicological and epidemiological research is needed to assess health risks from occupational exposures to multiple substances and to new materials e.g. development of job-exposure matrices. This needs to be considered for the life cycle of new green technologies (cradle-to-cradle).

Investigate better exposure assessment (job hazard analysis) through improved research methodologies. The long-term health implications from exposure to biological agents in these new technologies needs to be studied e.g. risks from green construction materials, bio-energy or in waste management.⁸²

In HBM4EU, more details are provided in the deliverable 7.4 (D7.4) of WP7.

Recommendations for HBM4EU for Occupational studies

- In relation to occupational studies the employees are candidates for participating in HBM studies. In this case the project participant is in a more vulnerable position than that of a project participant recruited outside the person’s workplace. The employee might feel obligated to participate, if the employer finds the project of importance to the company.
- When recruiting project participants at their place of employment, special considerations and safeguards need to be taken in order to avoid undue duress in the recruiting procedure. Also, special safeguards in relation to the protection of sensitive data needs to be taken in order to safeguard sensitive data from unauthorized use by the company.
- When determining the format for informing the companies/employers in relation to recruiting research participants in HBM studies, it is important to understand the different contractual nature of the assent of the employer/company. Both with regards to inviting the researcher to carry out the research at the company, as well as for the recruitment and information and procedure targeted to the employees (the prospect research participants).
- Guidelines in relation to Occupational Health studies are provided in Deliverable 7.4. of WP7.

15 HBM4EU: Caveats

15.1 Different legal framework: Data from living and from deceased persons

As the remit of the GDPR only covers data from living natural persons (Recital 27), biobanks and collection of health data will have to deal with the situation where some of the samples originates from living persons and therefore are covered by the remits of the GDPR and some of the samples originates from deceased persons covered by the remits of national legislation. It would be necessary to find out to what extent data from deceased persons will be incorporated into the project and to check the relevant national legislations provisions on the use of data from deceased persons. – It is to be expected that data from deceased persons are likely to occur in follow-up of previous studies.

⁸² Katalin Sas and others, *Priorities for Occupational Safety and Health Research in Europe: 2013-2020*. (Luxembourg: Publications Office, 2014), p. 31 <<http://dx.publications.europa.eu/10.2802/25457>> [accessed 23 May 2018].

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15.2 Conditions for consent for already collected data

As explained above, even though the GDPR in some cases opens possibilities of secondary data use, the contractual obligations of the researcher towards the research participant are stated in the consent forms. In order to honour the bioethical principle of autonomy and self-determination, it is important to establish the conditions of the informed consent.

15.3 Condition for consent for collection of new data

The HMB4EU will collect new samples and data in relation to the different scientific research projects. The plan is to include some the samples data in the EU database IPCheM. In order to secure a common base for obtaining informed consent for the use of samples and data, it will be important to work on designing consent forms complying to the rights of the persons participating in the research – from the point of departure of bioethics and from the point of departure of data protection.

15.4 Obligations of data controllers and data processors

It is important to notice that although the GDPR in some cases paves the way for carrying out health research without consent and without the renewal of consent, the GDPR states in Article 89 (2):

“Where personal data are processed for scientific or historical research purposes or statistical purposes, Union or Member State law may provide for derogations from the rights referred to in Articles 15 (Rights of access by the data subject) 16 (Right to rectification), 18 (Right to restriction of processing) and 21 (Right to object) subject to the conditions and safeguards referred to in paragraph 1 of this Article in so far as such rights are likely to render impossible or seriously impair the achievement of the specific purposes, and such derogations are necessary for the fulfilment of those purposes.”

The in the Regulation, Article 17 (Right to erasure (“right to be forgotten”) it is stated in (3):

Paragraphs 1 and 2 shall not apply to the extent that processing is necessary:

(c) for reasons of public interest in the area of public health in accordance with points (h) and (i) of Article 9 (2) as well as Article 9 (3);

(d) for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89 (1) in so far as the right referred to in paragraph 1 is likely to render impossible or seriously impair the achievement of the objectives of that processing: or

(e) for the establishment, exercise or defence of legal claims.”

Given the short time of implementation of the GDPR, it is very difficult to say anything yet about how the exemptions of data subjects' rights in relation to research will be implemented. In the light of this - at present - a narrow interpretation of the exemption of data subjects' rights in the GDPR must be advisable. In order to honour the basic bioethics and data ethics' rights of research participants in HMB4EU, the consent of the participants – to participation to secondary use, of research data, must be obtained. In cases where the original consent is not covering secondary use, obtaining renewed consent (from participants or - if national legislation allows - renewed consent from Ethics Committees) must be carried out.

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15.5 Reflections on issues on data-management in HBM4EU

Taken from the point of view of contractual obligations, the signed consent form constitutes the researchers' contractual obligations towards the study participant. The contractual obligations often protect the principles of autonomy and integrity of the study participant. In addition to the contractual obligations, the researcher has other obligations towards the study participant in terms of protecting the vulnerability and integrity of the study participant and the research data. The obligations of the researcher thus cover a broad range of human rights, bioethical principles and data-ethical principles.

As seen above, the GDPR regulates the use of data for scientific research purposes and in some cases paves the way for using data for secondary research purposes without obtaining renewed consent or using data that are pseudonymised in a manner that prevents re-identification of the data subject (Art. 89 and Recitals no.156, 157, 159, 160, 161, 162). A main task for the HBM4EU is to identify the areas of the project where data according to the GDPR can be used without consent and identify whether there are other types of regulation (EU and national) offering better protection for the research person.

At present - a narrow interpretation of the Regulation in the remit of HBM4EU must be advisable, thus ensuring the consent of the participants and in case of secondary use, the obtaining of renewed consent (from participants or - if national legislation allows - renewed consent from Ethics Committees).

Another important area is the Regulation's mentioning of Data Protection by Design: The use of technological solutions to protection of data: Areas that are of importance to HBM4EU could be identified and agreed on for the application of common technical solutions in order to establish a common Data Protection by Design regime for HBM4EU:

- (a) Common technical and governance-based procedures for:
- (b) Pseudonymisation
- (c) Data Transfers
- (d) Carrying out Data Protection Impact Assessments
- (e) Ledgers for data transactions

15.6 Data controllers in HBM4EU – GDPR-obligations

Notify the research participants:

- About the processing of data and the identity of the data controllers
 - That a risk analysis will be performed for the various processing undertaken in the project.
 - That the supervisory authority will be notified as required
 - That local data protection officers will be involved in ensuring full compliance with data protection requirements
 - That ethics approval will be gained from the relevant ethics committees.
 - That the processing of both existing as well as new data occurs in agreement with the relevant data controllers and the basis upon which they initially gathered personal data.
- The main reference is made to HBM4EU Ethics Policy Paper, H2020 Guidance — How to complete your ethics self-assessment: V5.2 – 12.07.2016 and the GDPR.

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16 Recommendations

Chapter 16 contains a collection of recommendations found in the above chapters.

16.1 Recommendations: Models for consent and assent (Chapter 6)

- Check HBM4EU recommendations, guidelines and forms in WP 7 for information, assent and consent of vulnerable groups.
- Check HBM4EU recommendations, guidelines and forms in WP 7 for information, assent and consent of vulnerable groups.
- Secure consistency between what you state in the information material and the consent forms about secondary use of samples and data for research purposes and for transfer of samples and data to other repositories (HBM4EU and IPCHEM) - The consent of the research participant in the signed informed consent form is the legal basis for all use of samples and data.
- Check your national legal system and ethics committee system for national requirements regarding models for consent and assent
- Remember to create a special assent/consent form for the child – so it will be possible to find the form when the child reaches the age of majority

16.2 Recommendations GDPR: Protection of Personal Data (Chapter 9)

- Check recommendations, guidelines and forms on Data Collection, Data transfer from WP10
- Include information and clauses on secondary use of data in research participant information and informed consent forms
- Include information and clauses on transfer of data to IPCHEM-database (HBM4EU Database in IPCHEM) in research participant information
- DataTransfer: Check your national Ethics Committee system/Data Protection Agency/Your own institution's Data Protection Officers guidelines for requirements/approvals
- Remember GDPR's recommendation on "Privacy by Design" - Consider requirements for common technical and governance-based procedures for:
 - Pseudonymisation
 - Data Transfers
 - Carrying out Data Protection Impact Assessments
 - Ledgers for data transactions

Obligations for Data controllers in HBM4EU

In order to fulfil the obligations of the data controller:

- In the recruiting phase: Notify the research participants of the processing and the identity of the data controllers;
- That a risk analysis will be performed for the various processing undertaken in the project;
- That the supervisory authority will be notified as required;
- That local data protection officers will be involved in ensuring full compliance with data protection requirements;
- That ethics approval will be gained from the relevant ethics committees;
- That the processing of both existing as well as new data occurs in agreement with the relevant data controllers and the basis upon which they initially gathered personal data.

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16.3 Recommendations: Genetic data (Chapter 11)

- Check for any National organisational measures and oversight by competent bodies
- Biological samples are subject to national legislation – check national legislation on collection, handling, storing, and using biological samples (i.e. legislation regarding biobanks)
- Get ethics permits from national research ethics committee
- Comply with HBM4EU and own organisation's guidelines for carrying out risk assessments according to GDPR (DPIA -Data Protection Impact Analysis)
- Comply with WP10 Guidelines for Data transfer Agreements
- Comply with WP10 Guidelines for Material Transfer Agreements
- Occupational Health: Consider special safeguards regarding confidentiality and privacy in relation to genetic research in occupational health (to protect research participants rights in relation to health insurance rights)

16.4 Recommendations: Vulnerable groups (Chapter12)

- Ensure that research participants are protected from undue intrusion, distress, indignity, physical discomfort, personal embarrassment or psychological or other harm
- Ensure that the research process does not involve unwarranted material gain or loss for any participant
- Ensure that research results are disseminated in a manner that makes them accessible to the relevant social stakeholders
- Ensure that research is commissioned and conducted with respect for all groups in society regardless of race, ethnicity, religion and culture, and with respect for and awareness of gender or other significant social differences.

16.5 Recommendations: Children (Chapter 13)

- The person responsible of informing the child or the young person about participation must be able to communicate information about and implications of the research project to the child according to the age and maturity of the child.
- Older children should be included in the information-process about the research project, to the extent that the child or the young person will be able to understand the implications of the research project. This information-process must therefore be adapted to the child's ability of understanding. The child's or the young person's own decision must be taken into account when applicable and relevant. Protest also means resistance which is not formulated orally but which is expressed by the child's attitude, body language or resistance to physical intervention. Consent from the parents should not imply that an intervention can be made against the will of the child.
- If a 15-17-year-old research participant wishes, the young person must receive written information about the project. Both the oral and written information must be adapted to the age and maturity of the young person. The information must be based on the information to the parents. The research protocol should be enclosed for the information of the 15-17-year-old person.

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16.6 Recommendations: Cord blood/placenta (Chapter 13)

- The informed consent is critical and thus for use of CB samples and placenta tissue documents relate to information of donors and the informed consent form must be provided. Transfer agreements are needed in case samples are transferred between laboratories.
- In the case of mother child cohorts established for environmental health studies, reference should be made to existing cohorts and their transfer conditions of samples and data respecting the informed consent and data protection.

16.7 Recommendations: Occupational studies (Chapter 14)

- In relation to occupational studies the employees are candidates for participating in HBM studies. In this case the project participant is in a more vulnerable position than that of a project participant recruited outside the person's workplace. The employee might feel obligated to participate, if the employer finds the project of importance to the company.
- When recruiting project participants at their place of employment, special considerations and safeguards need to be taken in order to avoid undue duress in the recruiting procedure. Also, special safeguards in relation to the protection of sensitive data needs to be taken in order to safeguard sensitive data from unauthorized use by the company.
- When determining the format for informing the companies/employers in relation to recruiting research participants in HBM studies, it is important to understand the different contractual nature of the assent of the employer/company. Both with regards to inviting the researcher to carry out the research at the company, as well as for the recruitment and information and procedure targeted to the employees (the prospect research participants).
- Guidelines in relation to Occupational Health studies are provided in Deliverable 7.4. of WP7.

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1 Annex: Excel sheet for reporting ethics



science and policy
for a healthy future

Submission of documents related to research ethics and data/material transfer

Version 2018-28-05

Name of the study	In national language	
	In English	
	Used acronym	
	Country	Country ?
Owner of the study	Webpage of study	
	Institute	
	Contact person(s) name(s) and e-mail address(es)	
	Partner in HBM4EU	Partners ?
	For LTP, the beneficiary	Beneficiary ?

Please note: The filename should be descriptive of the contents and should include as prefix "InstituteAcronym_StudyAcronym_". For the different document types a different suffix: "InformedConsent", "InformationLeaflet", "EthicalApproval", ... or whatever is relevant as naming (e.g. UBA_ESB_InformedConsent). Avoid that the documents are named in national languages.

We emphasize to please use the same acronym for institute and study when filling out all other documentation regarding their data collection (such as the metadata fiche, data transfer agreement, material transfer agreement, ...).

Informed consent

Copy of the informed consent(s) and related information material in national language

Copy of the informed consent(s) and related information material in English, in available

Comments:

file name:

Drop down

file name:

Drop down

Ethical approval

Copy of the ethical approval in national language

Copy of the ethical approval in English, if available

If English version not available, provides a short summary of the contents

Is secondary use of data/samples in HBM4EU allowed

Name of the body/bodies issuing the ethical approval

Date of approval

Identification number for approval

Expiration date for approval

Comments:

file name:

Drop down

file name:

Drop down

Free text field

Drop down

Free text field

Free text field

Data protection

Copy of the data protection approval in national language

Copy of the data protection approval in English, if available

If English version not available, provides a short summary of the contents

Can aggregated data be transferred to HBM4EU repository

Can single measurement data be transferred to HBM4EU repository

Can aggregated data be transferred to HBM4EU repository

Name of the body/bodies issuing the data protection approval

Date of approval

Identification number for approval

Expiration date for approval

Comments:

file name:

Drop down

file name:

Drop down

Drop down

Drop down

Drop down

Date:

Date:

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Biobank	Copy of the biobank approval in national language	Drop down	
	Copy of the biobank approval in English, if available	Drop down	
	If English version not available, provides a short summary of the contents		
	Is secondary use of data/samples for HBM4EU allowed	Drop down	
	Name of the body/bodies providing approval		
	Date of approval	Date:	
	Identification number for approval		
	Expiration date for the approval	Date:	
	Renewal of the approval(s) is required before	Drop down	
	Which documents require renewal?	Approval ?	

According to the documentation provided, the following operations can be considered, after consultation of the data controller	Use of single measurement data for specific HBM4EU objectives	Drop down	Comments:		
	Use of single measurement data for all HBM4EU research	Drop down			
	Use of single measurement data without purpose limitation	Drop down			
	Use of aggregated data for specific HBM4EU objectives	Drop down			
	Use of aggregated data for all HBM4EU research	Drop down			
	Use of aggregated data without purpose limitation	Drop down			
	Information on planned data use	To be used by WP		WP?	Other WP / tasks:
	To be used in Task	Task?			
	The work will start	Calendar			
	Information on planned material use	To be used by WP		WP?	
To be used in Task	Task 1.4				
The work will start	Calendar				

Information on planned data use	Copy of the data transfer agreement - name of file dates	Drop down	file name:
	Copy of the material transfer agreement - name of file dates	Drop down	file name:

Local ethics expert	Name	
	E-mail address	
	Telephone number	
	Date	Calendar
Data Controller	Name	
	E-mail address	
	Telephone number	
	Date	Calendar
Person filling in this form	Name and capacity (data controller or processor)	
	E-mail address	
	Telephone number	
	Date	Calendar
Date when received by the leader of Task 1.5		Calendar

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2 Annex: Principles of GDPR

2.1 GDPR Art 5: Principles relating to the processing of personal data

Principles relating to processing of personal data

1. Personal data shall be:

(a) processed lawfully, fairly and in a transparent manner in relation to the data subject ('lawfulness, fairness and transparency');

(b) collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes; further processing for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes shall, in accordance with Article 89 (1), not be considered to be incompatible with the initial purposes ('purpose limitation');

(c) adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed ('data minimisation');

(d) accurate and, where necessary, kept up to date; every reasonable step must be taken to ensure that personal data that are inaccurate, having regard to the purposes for which they are processed, are erased or rectified without delay ('accuracy');

(e) kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data are processed; personal data may be stored for longer periods insofar as the personal data will be processed solely for archiving purposes in the public interest, scientific or historical research purposes or statistical purposes in accordance with Article 89 (1) subject to implementation of the appropriate technical and organisational measures required by this Regulation in order to safeguard the rights and freedoms of the data subject ('storage limitation');

(f) processed in a manner that ensures appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss, destruction or damage, using appropriate technical or organisational measures ('integrity and confidentiality').

2. The controller shall be responsible for, and be able to demonstrate compliance with, paragraph 1 ('accountability').

2.2 GDPR Article 6: Lawfulness of processing

1. Processing shall be lawful only if and to the extent that at least one of the following applies:

(a) the data subject has given consent to the processing of his or her personal data for one or more specific purposes;

(b) processing is necessary for the performance of a contract to which the data subject is party or in order to take steps at the request of the data subject prior to entering into a contract;

(c) processing is necessary for compliance with a legal obligation to which the controller is subject;

(d) processing is necessary in order to protect the vital interests of the data subject or of another natural person;

(e) processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller;

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(f) processing is necessary for the purposes of the legitimate interests pursued by the controller or by a third party, except where such interests are overridden by the interests or fundamental rights and freedoms of the data subject which require protection of personal data, in particular where the data subject is a child.

Point (f) of the first subparagraph shall not apply to processing carried out by public authorities in the performance of their tasks.

2. Member States may maintain or introduce more specific provisions to adapt the application of the rules of this Regulation with regard to processing for compliance with points (c) and (e) of paragraph 1 by determining more precisely specific requirements for the processing and other measures to ensure lawful and fair processing including for other specific processing situations as provided for in Chapter IX.

3. The basis for the processing referred to in point (c) and (e) of paragraph, 1 shall be laid down by:

- (a) Union law; or
- (b) Member State law to which the controller is subject.

The purpose of the processing shall be determined in that legal basis or, as regards the processing referred to in point (e) of paragraph 1, shall be necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller. That legal basis may contain specific provisions to adapt the application of rules of this Regulation, inter alia: the general conditions governing the lawfulness of processing by the controller; the types of data which are subject to the processing; the data subjects concerned; the entities to, and the purposes for which, the personal data may be disclosed; the purpose limitation; storage periods; and processing operations and processing procedures, including measures to ensure lawful and fair processing such as those for other specific processing situations as provided for in Chapter IX. The Union or the Member State law shall meet an objective of public interest and be proportionate to the legitimate aim pursued.

4. Where the processing for a purpose other than that for which the personal data have been collected is not based on the data subject's consent or on a Union or Member State law which constitutes a necessary and proportionate measure in a democratic society to safeguard the objectives referred to in Article 23 (1), the controller shall, in order to ascertain whether processing for another purpose is compatible with the purpose for which the personal data are initially collected, take into account, inter alia:

- (a) any link between the purposes for which the personal data have been collected and the purposes of the intended further processing;
- (b) the context in which the personal data have been collected, in particular regarding the relationship between data subjects and the controller;
- (c) the nature of the personal data, in particular whether special categories of personal data are processed, pursuant to Article 9, or whether personal data related to criminal convictions and offences are processed, pursuant to Article 10;
- (d) the possible consequences of the intended further processing for data subjects;
- (e) the existence of appropriate safeguards, which may include encryption or pseudonymisation.

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3 Annex: Contractual obligations for the participants of the HBM4EU Project

When signing the Grand Agreement each partner is obliged to provide the requested information at any time as specified:

ARTICLE 34 — ETHICS

34.1 Obligation to comply with ethical principles

The beneficiaries must carry out the action in compliance with:

- (a) ethical principles (including the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity⁸³ — and including, in particular, avoiding fabrication, falsification, plagiarism or other research misconduct) and
- (b) applicable international, EU and national law.

Funding will not be granted for activities carried out outside the EU if they are prohibited in all Member States. The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

The beneficiaries must ensure that the activities under the action do not:

- (a) aim at human cloning for reproductive purposes;
- (b) intend to modify the genetic heritage of human beings which could make such changes heritable (with the exception of research relating to cancer treatment of the gonads, which may be financed), or
- (c) intend to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer.

34.2 Activities raising ethical issues

Activities raising ethical issues must comply with the ‘**ethics requirements**’ set out in Annex 1.

Before the beginning of an activity raising an ethical issue, the coordinator must submit (see Article 52) to the *Commission* copy of:

- (a) any ethics committee opinion required under national law and
- (b) any notification or authorization for activities raising ethical issues required under national law.

If these documents are not in English, the coordinator must also submit an English summary of the submitted opinions, notifications and authorisations (containing, if available, the conclusions of the committee or authority concerned).

If these documents are specifically requested for the action, the request must contain an explicit reference to the action title. The coordinator must submit a declaration by each beneficiary concerned that all the submitted documents cover the action tasks.

34.3 Activities involving human embryos or human embryonic stem cells

Activities involving research on human embryos or human embryonic stem cells may be carried out only if:

- they are set out in Annex 1 or
- the coordinator has obtained explicit approval (in writing) from the *Commission* (see Art. 52).

⁸³ The European Code of Conduct for Research Integrity of ALLEA (All European Academies) and ESF (European Science Foundation) of March 2011. http://www.esf.org/fileadmin/Public_documents/Publications/Code_Conduct_ResearchIntegrity.pdf

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34.4 Consequences of non-compliance

If a beneficiary breaches any of its obligations under this Article, the grant may be reduced (see Article 43) and the Agreement or participation of the beneficiary may be terminated (see Art. 50). Such breaches may also lead to any of the other measures described in Chapter 6.

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4 Annex: Requirements resulting from the ethics review

The ethics requirements that the project must comply with are included as deliverables in the Work Package 17. Due to the special set-up of the HBM4EU project with Annual Work Plans, these requirements must be addressed in each annual Ethics report accompanying the Annual Work Plans.

D17.1: Human Cell Tissues (HTC) Requirement No. 3

1. In case human cells/tissues are obtained within the project, details on cells/tissues type and ethics approval must be provided.
2. In case human cells/tissues are obtained within another project, details on cells/tissues type and authorisation by primary owner of data (including references to ethics approval) must be provided.
3. In case of human cells/tissues stored in a biobank, details on cells/tissues type must be provided, as well as details on the biobank and access to it.

D17.2: Requirement No. 4

With respect to data protection,

1. a number of identifiers (related to the environment in which the data was collected: date of collection, format, hour, location, metadata sets...) will, if merged, open the way to re-identification. These aspects must be considered and adequately documented by the applicants, in particular with respect to enabling data access to tier groups of data users at different levels of aggregation.
2. a document from the responsible data management structure/individual must be provided stating that all planned measures comply with national and EU legislation (in particular with REGULATION (EU) 2016/679 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 April 2016),
3. Copies of the notifications/approvals/opinions/authorisations from the relevant data protection authorities for the proposed data collection and processing as well as re-use must be provided prior to any data treatment, this being electronic or other.
4. Detailed information on the informed consent procedures that will be implemented with regard to the collection, storage and protection of personal data must be submitted on request.
5. Detailed information must be provided on the procedures that will be implemented for data collection, storage, protection, retention and destruction and confirmation that they comply with national and EU legislation.
6. Templates of the informed consent forms and information sheets must be submitted on request.

D17.3: Requirement No. 5

In case research on animals will be performed (yet unclear, see B2, p.220),

1. Copies of relevant authorisations (for breeders, suppliers, users, and facilities) for animal experiments must be submitted.
2. Copies of project authorisation (covering also the work with genetically-modified animals, if applicable) must be submitted.
3. In case research protocols are not defined, general information must be kept by the beneficiary in the project files on the nature of the experiments, the procedures to ensure the welfare of the animals, and how the Principle of the Three Rs will be applied. This information must be provided upon request.
4. Detailed information must be provided on why living animals have to be used as well as on which species and why that species has been chosen. In addition, information should be given on the numbers of animals to be used in experiments, the nature of the experiments, the procedures that will be carried out and their anticipated impact (e.g. potential for pain, suffering, distress) and how that has been minimised. Furthermore, details should be provided on what procedures have

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been implemented to ensure the welfare of the animals during their lives (e.g. husbandry, minimising harms, criteria for humane endpoints, inspection protocols). The applicant should provide evidence of awareness of relevant European legislation and regulations covering animal experimentation and that the Principle of the Three Rs will be rigorously applied.

5. If applicable, copies of training certificates/personal licenses of the staff involved in animal experiments must be provided.

D17.4: Requirement No. 9

Copies of all partner ethical approvals relevant to the project must be provided whenever available.

D17.5: Requirement No. 2

1. Information must be provided on whether adults unable to give informed consent will be involved and, if so, justification for their participation must be provided.
2. Information must be provided on how consent/assent will be ensured with respect to the participation of children and -if applicable- adults unable to give informed consent
3. If vulnerable individuals/groups will be involved, details must be provided about the measures taken to prevent the risk of enhancing vulnerability/stigmatisation of individuals/groups.
4. With respect to participants, who have indicated on the consent form that they want to receive their individual results, the applicants must take into consideration potential detrimental socioeconomic disadvantages such information can have for participants when they want to apply for private health insurance, life insurance or occupational disablement insurance, and inform the participants on such issue accordingly in the informed consent forms.

D17.6: Requirement No. 10

All Material Transfer Agreements need to be provided to the European Commission.

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5 Annex: Specific recommendations - human studies/cohorts

The ethics issues defined by the national and EU legislation must be clarified before inclusion of any data and samples into HBM4EU as defined in the ethics self-assessment document issued by H2020.

Some countries have specific national requirements to be further resolved and the partner in HBM4EU providing the data as obliged to fulfil these. Consultation of local legal and ethics expertise may be necessary and the partner has to identify such expertise and inform the HBM4EU coordination team.

5.1 Ethics issues to be clarified and documents to be provided

Does your research involve human participants?	Confirm that informed consent has been obtained. plus:	Informed Consent Forms + Information Sheets. plus:
- Are they volunteers for social or human sciences research?	Details of recruitment, inclusion and exclusion criteria and informed consent procedures.	Copies of ethics approvals (if required).
- Are they persons unable to give informed consent (including children/minors)?	Details of your procedures for obtaining approval from the guardian/ legal representative and the agreement of the children or other minors. What steps will you take to ensure that participants are not subjected to any form of coercion?	Copies of ethics approvals.
- Are they vulnerable individuals or groups?	Details of the type of vulnerability. Details of recruitment, inclusion and exclusion criteria and informed consent procedures. These must demonstrate appropriate efforts to ensure fully informed understanding of the implications of participation.	Copies of ethics approvals.
- Are they children/minors?	Details of the age range. What are your assent procedures and parental consent for children and other minors? What steps will you take to ensure the welfare of the child or other minor? What justification is there for involving minors?	Copies of ethics approvals.
- Are they patients?	What disease/condition /disability do they have? Details of recruitment, inclusion and exclusion criteria and informed consent procedures What is your policy on incidental findings?	Copies of ethics approvals.
- Are they healthy volunteers for medical studies?		Copies of ethics approvals.
Does your research involve physical interventions on the study participants?		
If YES:	- Does it involve invasive techniques (e.g. collection of human cells or tissues, surgical or medical interventions, invasive studies on the brain, TMS etc.)?	Risk assessment for each technique and overall Copies of ethics approvals.

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- Does it involve collection of biological samples?	What type of samples will be collected? What are your procedures for collecting biological samples?	Copies of ethics approvals.
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6 Annex: Specific recommendations when using, producing or collecting human cells and tissues

Research with cells and tissues must comply with ethical principles, especially informed consent, from the donor and applicable international, EU and national law (in particular, EU Directive 2004/23/EC). Under this Directive, the handling of cells and tissues is subject to specific rules (in particular, concerning donor selection/protection; accreditation/designation/authorization/ licensing of tissue establishments and tissue and cell preparation processes; quality management of cells and tissues; procurement, processing, labelling, packaging, distribution, traceability, and imports and exports of cells and tissues from and to third countries).

The main obligations are to:

- keep track of the origin of the cells and tissues you use, produce or collect and to
- obtain the necessary accreditation/designation/authorization/licensing for using, producing or collecting the cells or tissues
- free and fully informed consent of the donors.

HBM4EU may obtain cells or tissues from commercial sources, as part of this research project, from another research project, laboratory or institution, from a biobank.

The requirements are stated below:

Does your research involve human cells or tissues	Details of the cells or tissue types. plus:	Copies of relevant ethics approvals. Copies of accreditation /designation/authorization/ licensing for using, processing or collecting the human cells or tissues (if required), plus:
- Are they available commercially?	Details of provider (company or other).	Copies of import licenses (if relevant).
- Are they obtained within this project?	Details of the source of the material, the amount to be collected and the procedure for collection. Details of the duration of storage and what you will do with the material at the end of the research. Confirm that informed consent has been obtained.	Informed Consent Forms + Information Sheets.
- Are they obtained from another project, laboratory or institution?	Country where the material is stored. Details of the legislation under which material is stored. How long will the material be stored and what will you do with it at the end of the research project? Name of the laboratory/institution. Country where the laboratory/institution is located.	Copies of import licenses (if relevant). Statement of laboratory/institution that informed consent has been obtained. Confirm that material is fully anonymised or that consent for secondary use has been obtained.

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- Are they obtained from a biobank?	Name of the biobank. Country where the biobank is located. Details of the legislation under which material is stored. Confirm that material is fully anonymised or that consent for secondary use has been obtained.	Copies of import licenses (if relevant). Statement of biobank that informed consent has been obtained.
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7 Annex: Specific recommendations for animal studies

When experimental studies include animals, the studies must comply with ethical principles, applicable national, EU and international law, in particular, EU Directive 2010/63/EU⁸⁴. This Directive is designed to limiting the use of animal testing for scientific purposes. It sets out EU-wide animal welfare standards (including authorisations, restrictions on the use of certain kinds of animals, standards for procedures, minimum requirements for personnel, recording and traceability, care and accommodation). The directive stresses the 3R's principles and the protocol must explain how all 3R's have been addressed.

7.1 Principles for 3Rs

This means that you must choose alternatives to animal use where possible and implement the principles of **replacement, reduction and refinement ('three Rs')**.

- **Replacement** — replacing animal use by an alternative method or testing strategy (without use of live animals).
 - **Examples**
 - *'Higher' animals can be replaced by 'lower' animals: microorganisms, plants, eggs, reptiles, amphibians, and invertebrates may be used in some studies to replace warm-blooded animals. Live animals may be replaced by non-animal models, such as dummies for an introduction to dissection for teaching the structure of the animal or the human body, mechanical or computer models, audio-visual aids, or in vitro modelling.*
- **Reduction** — reducing the number of animals used.
- **Refinement** — improving the breeding, accommodation and care of animals and the methods used to minimise pain, suffering, distress or lasting harm to animals.

⁸⁴ Directive 2010/63/EU Of The European Parliament And Of The Council of 22 September 2010 on the protection of animals used for scientific purposes <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0063&from=EN>

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7.2 Ethics issues to be clarified and documents to be provided

The Directive request information as indicated in the table below

Details of species and rationale for their use, numbers of animals to be used, nature of the experiments, procedures and techniques to be used. Justification of animal use (including the kind of animals to be used) and why alternatives cannot be used.

- Are they vertebrates?		
- Are they non-human primates (NHP) (e.g. monkeys, chimpanzees, gorillas, etc.)?	Why are NHPs the only research subjects suitable for achieving your scientific objectives? Explain. What is the purpose of the animal testing? Give details. Where do the animals come from? Give details.	Personal history file of NHP.
- Are they genetically modified?	Details of the phenotype and any inherent suffering expected. What scientific justification is there for producing such animals? Give details. What measures will you take to minimise suffering in breeding, maintaining the colony and using the GM animals? Give details.	Copies of GMO authorisations.
- Are they cloned farm animals?	Details of the phenotype and any inherent suffering expected. What scientific justification is there for producing such animals? Give details. What measures will you take to minimise suffering in breeding, maintaining the colony and using of the GM animals? Give details.	Copies of authorisations for cloning (if required).
- Are they an endangered species?	Why is there no alternative to using this species? Give details. What is the purpose of the research? Give details.	Copies of authorisations for supply of endangered animal species (including CITES).