



DRAFT GUIDELINES FOR HUMAN BIOBANKS AND GENETIC RESEARCH DATABASES

TEXT FOR COMMENT

The OECD is inviting comments on the draft *Guidelines for Human Biobanks and Genetic Research Databases*. The deadline for submitting comments is **16th May 2008**.

Comments may be provided via email at: hbgrd.guidelines@oecd.org Comments may also be provided directly through our Web Site at: www.oecd.org/sti/biotechnology/hbgrd

This version of the draft Guidelines is being released to elicit public comments. This is not a final version of the draft Guidelines.

CONSENT: In the event that the OECD will publish the responses received, please indicate clearly whether or not you wish to have your comments rendered public, including associated with your name or your organisation's name. In the event that consent is not clearly expressed, it will be presumed to not have been given.

DRAFT GUIDELINES FOR HUMAN BIOBANKS AND GENETIC RESEARCH DATABASES:

TEXT FOR COMMENT

TABLE OF CONTENTS

PREFACE

SCOPE

PART I: PRINCIPLES AND BEST PRACTICES FOR HUMAN BIOBANKS AND GENETIC RESEARCH DATABASES

- HBGRDs Generally
- Establishment of HBGRDs
- Governance, Management, and Oversight
- Terms of Participation
- Contents of HBGRDs
- Protection of Human Biological Materials and Data
- Access
- Qualification, Education and Training
- Custodianship, Benefit-sharing and Intellectual Property
- Demise of the HBGRD and Disposal of Materials and Data

PART II: ANNOTATIONS

- HBGRDs Generally
- Establishment of HBGRDs
- Governance, Management, and Oversight
- Terms of Participation
- Contents of HBGRDs
- Protection of Human Biological Materials and Data
- Access
- Qualification, Education and Training
- Custodianship, Benefit-sharing and Intellectual Property
- Demise of the HBGRD and Disposal of Materials and Data

GLOSSARY

PREFACE

These Guidelines offer principles and best practices for, and are targeted at all those involved in, the establishment and governance of human biobanks and genetic research databases (HBGRDs). The Guidelines are intended to assist both OECD and non-OECD governments in the development of policies applicable to HBGRDs.

Research in Human Health

The completion of the first mapping of the human genome under the Human Genome Project has opened huge potential for research into the ways in which genes relate to human conditions, diseases, capacities, impairments and susceptibilities. Research involving the human genome and resulting applications open up new prospects in improving the health of individuals and of humankind as a whole.

These advances in our understanding of genetics and genomics have moved science into the post-genomic era and lead to the emergence of other “omics” sciences, such as proteomics, transcriptomics, and metabolomics. These new areas of sciences also offer much promise for unravelling the biochemical and physiological mechanisms of complex multivariate diseases at the functional molecular level. The ability to effectively use these vast amounts of knowledge will depend in part of the bringing together of different strands of information and data within databases.

Research and Human Biobanks and Genetic Research Databases

Research involving human genetic or genomic information analyzed in conjunction with other personal or health data has become increasingly important for understanding risk factors underlying complex (multi-factorial) diseases. Such research will be critical to improvements in detection, prevention, diagnosis, treatment, and cures, including for new products and services. To support these research endeavours, great emphasis has been placed on the establishment and sharing of data resources comprised of data, biological samples and information derived from the analysis of those samples.

Advances in biotechnology and bioinformatics afford the opportunity to store and analyse an increasingly larger number and array of biological samples and genetic data. Biobanks and genetic research databases, as resources comprising the collection of samples and information, have become feasible as a result of such advances in science’s knowledge of biotechnology and bioinformatics.

There is strong consensus in the scientific community that progress in understanding disease etiology will be achievable with the establishment and broad use of HBGRDs. Current uses of HBGRDs are already contributing significantly to our understanding of genetic and environmental factors that influence disease risk and treatment including a better understanding of the reasons for drug reactions (both positive and negative). To serve these purposes, HBGRDs may be established in diverse forms. For example, HBGRDs may be any of the following, or a combination thereof: cross-sectional, longitudinal, large-scale, disease-specific, or population-based. Such data resources will provide platforms for international collaboration on a scale not previously attained.

It is clear that wide access to such data for biomedical advances must be balanced by concern for the interests of research participants. The ability to establish biobanks and genetic research databases will depend in part on research participants’ willingness to contribute. Research must respect the participants and be conducted in ways that uphold human dignity, fundamental freedoms and human rights.

Within these Guidelines, the principles and best practices aim to balance the interests of researchers—who need access to human genetic samples and information from many sources— with the needs of individual participants and their relatives—whose autonomy is to be respected and whose privacy is to be protected.

Nature and Structure of the Document

These Guidelines cover a broad reach of activities and are intended to be interpreted as appropriate to the circumstances. Moreover, these Guidelines are not intended to cover exhaustively all aspects of HBGRDs. Further complementary technical issues covered in the OECD *Best Practice Guidelines for Biological Resource Centres* which target quality assurance aspects that should be addressed to ensure the supply of high quality biological materials. The Recommendation on *Guidelines for Human Biobanks and Genetic Research Databases* was adopted by the OECD Council on xxx.

These Guidelines are intended to be evolutionary in nature and should be reviewed in light of relevant scientific developments. Thus, there will be a need for these Guidelines to be assessed, four years after adoption at the latest, and periodically thereafter, in order to ensure that they are fostering the desired objectives. They should at all times be read and applied in a purposive manner.

Part One sets out the Principles and Best Practices applicable to HBGRDs. Part Two contains explanatory Annotations which elaborate on the Principles and Best Practices found in Part One.

SCOPE

The aim of these Guidelines is to provide guidance on the establishment, governance, management and use of Human Biobanks and Genetic Research Databases (HBGRDs) used for purposes of genetic research.

For the purposes of these Guidelines, human biobanks and genetic research databases (HBGRDs) are structured resources that can be used for the purpose of genetic research, which include: a) human biological materials and/or information generated from the analysis of the same; and b) extensive associated information.

Although it is intended that these Guidelines are applied as broadly as possible, it is also recognised that, depending on the nature and size of the HBGRD, while these may be useful they may not be directly applicable in whole. For example, some principles and best practices included in these Guidelines may not be applicable to a small, individual HBGRDs not intended for sharing.

It is recognised that pre-established HBGRDs may have scientific value. While these Guidelines are intended to be applicable to pre-established HBGRDs, it is also recognised that the application of some of the principles and best practices may not be fully feasible. These Guidelines may also not fully apply to HBGRDs established primarily for the research and development of a medical product, diagnostic or medical device with the objective of obtaining market authorisation.

These Guidelines are not intended to be applicable to resources established principally for non-research purposes, such as for diagnosis, therapeutic, treatment, forensic, transplantation, transfusion, audit, public health surveillance, quality assurance purposes or as teaching materials.

PART I: PRINCIPLES AND BEST PRACTICES

1. HBGRDs Generally

Principles

- 1.A The objective of a HBGRD should be to foster research within legal norms and ethical principles.
- 1.B As appropriate, HBGRDs should make data and materials rapidly and widely available to researchers so as to advance knowledge and understanding.
- 1.C A HBGRD should be established, governed, managed and used in accordance with applicable domestic law and international instruments.
- 1.D Given the significant resource implications of establishing and maintaining a HBGRD, the practical and financial feasibility of the HBGRD should be assessed and the financial resources should be secured, as early as possible.
- 1.E The HBGRD should be established, governed and managed in such a manner as to ensure that the collection and use of participants' human biological materials as well as all data are scientifically, legally and ethically appropriate.
- 1.F Throughout its existence, a HBGRD should respect human rights and freedoms and secure the protection of privacy and the confidentiality of data.
- 1.G The HBGRD should consider and minimise risks to individuals, their families and potentially identifiable populations or groups whose specimens and data are included in the HBGRD and used for research.

Best Practices

- 1.1 The initiators should make available information on the scientific rationale underlying the HBGRD, and on the scientific and business risks and uncertainties associated with the establishment, operation and use of the HBGRD.
- 1.2 While participants should not be paid for their participation in the HBGRD, reimbursement of reasonable costs incurred in order to contribute to the HBGRD is acceptable. Such compensation should not be of a magnitude so as to provide inducement to participate.
- 1.3 The HBGRD should have in place protocols and processes to protect personal medical information, including, but not limited to genetic information, in light of its potential predictive nature.
- 1.4 Appropriate measures should be taken to avoid discrimination against or stigmatisation of a person, family or group, whether or not they have contributed to the HBGRD.
- 1.5 The HBGRD should have in place protocols and processes to safeguard the privacy of participants.

2. *Establishment of HBGRDs*

Principles

2.A The purpose(s), both current and future, of the HBGRD should be clearly formulated, and communicated as early and as widely as possible, especially to potential participants and potential users.

2.B In the establishment of the HBGRD, the initiators should carry out consultations with stakeholders and the general public.

2.C The HBGRD should develop a business plan, including a financial model, that it intends to adopt over its lifespan in order to ensure its sustainability.

2.D The HBGRD should be explicit and transparent about the nature and source of its financing/funding.

2.E The HBGRD should develop a business strategy in the event that funding is terminated or its nature changed.

2.F The HBGRD should ensure that it has sufficient professional staff and resources to operate effectively in all aspects.

2.G The HBGRD should develop plans for ensuring the ongoing support of the human biological materials and data throughout its existence.

Best Practices

2.1 The HBGRD should make information publicly available in easily accessible form detailing its background, purpose, ethical and governance framework, name(s) of senior management, answers to frequently asked questions (FAQs) as well as contact information for a representative who will answer questions from the public.

2.2 As relevant for the HBGRD, consultations should be carried out with a number of diverse groups, including the public, patient groups, industry, through different means, and should cover a variety of topics.

2.3 The extent and types of consultations with relevant stakeholders should be based upon considerations of the nature and design of the proposed HBGRD, the risks involved to participants and their families and to identifiable groups, any particular sensitivities related to the individuals and groups under study, and of the types of research to be conducted with the HBGRD.

2.4 In carrying out consultations, the initiators should clearly indicate to stakeholders the manner in which their input may influence the establishment and impact the future aims of the HBGRD.

2.5 In carrying out consultations, the initiators should articulate as much as is known about the possible future scope of the HBGRD.

2.6 Funding for a HBGRD may come from public, private or public-private partnership sources.

2.7 Where a HBGRD foresees attracting private or foreign investment or entering in commercial collaborations, this should be clearly articulated and communicated, especially to participants.

2.8 The HBGRD should ensure that it has appropriate staff and resources to preserve records, data and human biological materials appropriately, and to handle requests for access to data and human biological materials.

2.9 When establishing a HBGRD, consideration should be given to future collaboration and cooperation, especially as regards database compatibility and interfaces. Appropriate design elements providing for such compatibility and interfaces should be incorporated when creating the databases. The HBGRD should give consideration to using standardised approaches for the collection, storage and analysis of human biological materials and/or data so as to facilitate cross-HBGRD data exchange and sharing.

2.10 When establishing a HBGRD, the initiators should develop criteria for sampling and participant selection so as to ensure that the data contained in the HBGRD are representative of the targeted population and are scientifically appropriate for its intended use.

3. *Governance, Management, and Oversight*

Principles

- 3.A The HBGRD should be governed by the principles of transparency and accountability.
- 3.B The initiators of the HBGRD should clearly formulate the governance structure and management responsibilities applicable to the HBGRD and should make available information to participants, stakeholders and the general public.
- 3.C The governance structure should ensure that the rights and well-being of the participant prevail over the research interests of the initiators and users of the HBGRD.
- 3.D Within its governance structure, the HBGRD should have a mechanism to review applications for access to the human biological materials and/or data.
- 3.E It is the shared responsibility of all HBGRD personnel, researchers and partners to ensure that all HBGRD activities are carried out in accordance with the highest legal norms and ethical principles. Specific roles and chains of responsibilities of those involved in the HBGRD's activities should be clearly delineated.
- 3.F A HBGRD should have in place oversight mechanisms to ensure that the governance, management and operation of the HBGRD comply with applicable domestic and international ethical, financial, and regulatory legislation, policy and frameworks.
- 3.G In light of the nature and purpose of the HBGRD, the individuals involved in the oversight procedure should be drawn from diverse relevant areas of expertise, including the scientific, legal, and ethical fields.
- 3.H Participants should have access to an independent means of recourse for redressing breaches of the ethical, financial, and regulatory legislation, policy and frameworks.
- 3.I The HBGRD should anticipate that over its lifespan the need to modify its policies, protocols and procedures will arise. Within its governance structure, the HBGRD should have in place a process for undertaking these modifications.
- 3.J The HBGRD should have in place an independent audit mechanism to review uses of the human biological materials and data for consistency with the research uses agreed to by a participant during the informed consent process.

Best Practices

- 3.1 The HBGRD's protocols, processes and activities should be approved, unless exempted, by an independent research ethics committee and be subject to unbiased scientific peer review.
- 3.2 Oversight mechanisms should ensure transparency by making publicly available information on compliance of the HBGRD with applicable domestic law and international instruments. The HBGRD

should also make publicly available information on key elements of applicable domestic law and international instruments.

3.3 A responsible position(s) should be identified to ensure compliance with the governing requirements of the HBGRD, including the legal, financial, ethical, policy and managerial requirements.

3.4 The initiators of the HBGRD should ensure participant's have access to information about the type of research being carried out with the human biological materials and data contained within the HBGRD.

3.5 HBGRDs should identify a responsible position or positions for ensuring the security and custodianship of human biological materials and data, including through the implementation of adequate protection measures.

3.6 Review processes including research ethics committees or other oversight mechanisms should be in place for use in cases where human biological materials or data are to be used in a manner not anticipated in the original informed consent process, including for previously collected human biological materials or data where the use might deviate from the original consent; for cases where informed consent may not have been obtained at the time of collection; for determining when to seek re-consent; and for use of human biological materials or data which were consented using a broader or layered format for unspecified future uses, especially in the case of large-scale genetic epidemiology studies.

3.7 The process for modifying the HBGRD's policies, protocols and procedures should include a means for participants to be informed about these modifications.

3.8 Where a HBGRD's policy, protocol or procedure is significantly modified, the initiators should ensure that a new consent is obtained from the participant, where feasible, or should obtain appropriate waiver of consent from a research ethics committee or the appropriate authorities.

3.9 The initiators of the HBGRD should ensure that information is made publicly available about significant modifications to the HBGRD's policies, protocols, or procedures.

4. *Terms of Participation*

Principles

4.A Participant recruitment should be carried out in a non-coercive and equitable manner that respects individual freedom of choice, confidentiality and privacy.

4.B HBGRDs should obtain prior, free and informed consent from each participant. Where applicable, HBGRDs should provide for obtaining consent or authorisation from the appropriate substitute decision-maker.

4.C HBGRDs should give careful consideration to any special issues related to the participation of vulnerable populations or groups, including children, individuals with impaired decision-making capacity, and prisoners.

4.D During the informed consent process, HBGRDs should provide potential participants with sufficient information on the nature, implications, foreseeable risks and benefits of their participation, so that they can realistically assess the implications of their participation and can make an informed decision on whether to participate. This information should be presented so as to not constitute an improper inducement to participate in the research.

4.E The informed consent process should pertain to the human biological materials and data to be collected and the health and other records to be accessed, their intended uses, storage and duration of storage, transfer and disposal procedures.

4.F The HBGRD should inform participants of their right to withdraw, of the nature of and modalities for exercising that right, as well as the implications of and limits to exercising that right.

4.G HBGRDs should have a clearly articulated policy about the effects, if any, of the participant's death or loss of legal capacity, and participants should be informed of this policy.

4.H HBGRDs should have a clearly articulated policy on the nature of the feedback that will be provided to participants, taking into account any domestic legal requirements. This policy should cover the feedback of individual-level results, if any, as well as aggregate results arising from research carried out using human biological materials and/or data from the HBGRD.

4.I Participants should be provided with the opportunity to decide on whether or not to receive feedback of individual-level results arising from research.

4.J As a general rule, non-validated results from scientific research using a HBGRDs' human biological materials and data should not be reported back to the participants and this should be explained to participants during the consent process.

4.K Where a HBGRD has offered and the participant has elected to receive feedback of individual-level results, and depending on the nature of the feedback, it may be appropriate for a trained professional to provide this feedback to participants or for counselling to be available to participants.

4.L HBGRDs should have a clearly articulated policy on whether participants will be re-contacted during the course of the HBGRD's existence, the situations for which re-contact will be permitted, and the conditions that will govern re-contact.

Best Practices

- 4.1 HBGRDs should have clear and detailed protocols and processes in place regarding the process of informed consent.
- 4.2 For HBGRDs established from existing collections, the initiators should consider whether the intended scope and purpose of the HBGRD and intended research uses of the human biological materials and data are consistent with the original informed consent. Where the intended scope of the HBGRD or its intended uses are not within the scope of the original informed consent, the human biological materials and data may only be used if a new consent is obtained, where feasible, or if a research ethics committee or the appropriate authorities provide waiver of consent.
- 4.3 Throughout the lifespan of the HBGRD, the research use of human biological materials and data should be consistent with the original informed consent or new consent should be sought, except where otherwise provided by domestic law and consistent with international legal norms and ethical principles.
- 4.4 The informed consent materials should be written in clear, concise and simple language understandable for the participant.
- 4.5 Where appropriate, participants should be provided with the opportunity to communicate with representatives of the HBGRD, or as required designees, to discuss its nature and scope.
- 4.6 HBGRDs involving child participants should have a clear policy on whether, when and how a child's assent will be obtained.
- 4.7 HBGRDs involving child participants should have a clear policy on what steps, if any, will be taken once the child becomes legally competent to consent.
- 4.8 HBGRDs should have a clear policy on whether autopsy material will be collected, what will be collected and under what circumstances this will be carried out.
- 4.9 HBGRDs should inform participants that they may exercise their right to withdraw without any need to provide any explanations.
- 4.10 Consideration should be given to employing different formats and modes for providing information to participants during the informed consent process and during the lifespan of the HBGRD. Communication strategies should also take into consideration the different needs of participants.
- 4.11 The HBGRD should ensure traceability of the human biological materials and data in order to safeguard the participant's right of withdrawal.

5. *Contents of HBGRDs*

Principles

5.A HBGRDs should have a clearly articulated policy and should communicate to potential participants which human biological materials and data will be collected from them or from other sources, stored and used for research purposes.

5.B HBGRDs should have a clearly articulated policy on whether data will be accessed from health or other records, independently assembled, and whether or not these data will be linked with or stored in the HBGRD. Such a policy should also address the issue of secondary use of health and other records, especially when combined with other data. Where HBGRDs intend to access data from health or other records, it should ensure that participants are duly informed and that their informed consent for accessing such records is obtained.

5.C HBGRDs should develop a clearly articulated policy in regard to the selection of specimens. Protocols should be developed such that the least invasive approach, associated with the least physical risk to the participant, should be pursued. Means to minimize the risk of invasive procedures should be in place.

5.D HBGRD databases and specimen tracking and auditing processes for appropriate quality control should be consistent with the maintenance of participant confidentiality.

5.E HBGRDs should develop a clear policy on whether results from research carried out using human biological materials or data accessed from the HBGRDs should be incorporated into the HBGRD. The policy should include the standard of quality applicable for incorporation of results into the HBGRD.

5.F All human biological materials and data should be subject to proper quality control and quality assurance measures at every stage of its processing including procurement, collection, labelling, registration, storage, tracking, retrieval, dissemination, use and destruction in order to ensure high standards of quality in all HBGRD holdings.

5.G The HBGRD should develop and maintain clearly documented operating procedures and policies for the procurement, collection, labelling, registration, processing, storage, tracking, retrieval dissemination, use and destruction of specimens and/or data.

Best Practices

5.1 In its policy, the HBGRD should specify which type of data will be collected, including personal, medical/health, biochemical, life-style, genealogical, family-history, genetic, physiological and other demographic and personal data, as well as specify the source of the data collected.

5.2 HBGRDs should have a clearly articulated policy regarding how they will deal with analysis that becomes possible or data that may be collectible in the future as a result of technological developments, especially if new information may be derived that is not covered by the participants' informed consent.

5.3 In the case that data are accessed from health and other records, participants should be informed at the time of consenting, which data will be extracted from such records, by whom and through which processes, and for which uses the data will be employed. Consent and/or authorisation for access to and use of health and other records should be obtained as required by applicable law.

5.4 The types of human biological materials and data collected and stored in the HBGRD should meet specified criteria justifiable based on the scientific objectives and purposes of the HBGRD.

5.5 If the HBGRD will not perform specific types of tests or will not enter specific types of data, it should have a clearly articulated policy and should communicate this to participants.

5.6 The HBGRD's policy on procurement, collection, labelling, registration, processing, storage tracking, retrieval dissemination, use and destruction of human biological material and data should take into consideration cultural heritage and/or religious beliefs known or disclosed by participants, and their representative groups.

5.7 All of the HBGRD's holdings should be maintained through a system that allows the administrative data, the human biological materials, the phenotypic data and any other information to be tracked.

5.8 Where the HBGRD intends to actively seek data, information or other linkages about its participants from third party sources, it should disclose this to participants, and as required by domestic law, it should obtain the informed consent of the participant.

6. *Protection of Human Biological Materials and Data*

Principles

6.A HBGRDs should be established, managed and governed in such a way as to prevent any inappropriate or unauthorised uses of participants' human biological materials and data.

6.B HBGRDs should establish policies and procedures for the protection of the human biological materials and data, especially those potentially permitting, whether directly or indirectly, the identification of the participant.

6.C The HBGRD should ensure that the data and information contained within its databases should be protected in accordance with applicable domestic law, especially in regard to the protection of privacy.

6.D Prior to the collection of human biological materials and data, HBGRDs should make available to participants information about the level of protection to which their human biological materials and data will be subject and the means that will be employed for this protection.

6.E In order to foster the interoperability of systems and facilitate the scientific exchange of data and human biological materials, the HBGRD should collect, process, handle and store the specimens and data in a manner consistent with internationally-accepted technological standards and norms.

6.F The HBGRD should have a clearly articulated policy on the duration of storage of the human biological materials and the data, recognising that the duration of storage may vary according to the nature and the potential uses of the specimen or data. Specific conditions may apply for human biological materials and data which form part of an application for market authorization of a medical product or a medical device.

6.G Quality assurance measures should be in place, including conditions to ensure continued operation of storage, security and confidentiality during collection, storage, handling, distribution and destruction of the human biological materials and data.

Best Practices

6.1 A responsible position(s) should be identified for ensuring the protection of data and privacy.

6.2 The HBGRD should consider the extent to which the genetic data held by them might allow, alone or in combination with other available data and reference samples, the participant to be identified. The HBGRD should establish a clearly articulated policy of whether certain data will not be made available.

6.3 The specific risks for participants of unauthorized access to the information in the database should be addressed. Information should be provided on how privacy and confidentiality is secured.

- 6.4 HBGRDs should protect privacy and confidentiality through a combination of mechanisms, as appropriate, including for example secure storage of human biological materials and data, coding and encryption of these, data enclaves, and honest broker systems.
- 6.5 Data protection should, where appropriate, involve the separation of information that can readily identify an individual from other data, including genotypic data.
- 6.6 HBGRDs should have in place a robust infrastructure, consisting of both hardware and software components, so as to prevent unauthorised access to databases.
- 6.7 HBGRDs should ensure that only a restricted number of properly authorised staff have access to information identifying or potentially identifying participants, that such access be monitored and documented and only be exercised when necessary for carrying out HBGRD-related functions.
- 6.8 Processing, handling and storage of human biological materials and data should be conducted in a manner that protects the privacy of the participant and the confidentiality of their specimens and data.
- 6.9 The OECD *Best Practice Guidelines for Biological Resource Centres* provide technical and practical best practices applicable for, amongst others, hygiene, equipment, storage conditions such as temperature, packaging of materials being provided, and quality audit.

7. *Access*

Principles

7.A HBGRDs should develop clear policies and procedures for accessing human biological materials and data in their databases, which should be based on objective and clearly articulated criteria.

7.B Access and use of human biological material and data should be consistent with the terms of participation and should respect the privacy of the participant and confidentiality of the human biological materials and data.

7.C HBGRDs should provide participants with explicit information on whether or not their human biological materials and data, in whole or in part, will be made accessible to third parties for non-research purposes.

7.D The HBGRD should not make accessible or disclose participants' human biological materials or data obtained for health research purposes to third parties for non-research purposes, including to insurance providers, employers, or to law enforcement agencies, except where required by law. The informed consent document should be transparent and explicit about any legal requirements to share human biological materials or data with third parties.

7.E Unless strictly necessary, researchers should be provided access only to human biological materials, data or information that is coded such that the participant cannot be identified and researchers should be required to not attempt to re-identify participants. Such exceptional conditions should be clearly disclosed to research participants during the informed consent process.

7.F HBGRDs should have a clearly articulated policy on whether researchers using its database(s) will be allowed to contact participants directly.

7.G Given the potentially finite nature of human biological materials, HBGRDs should formulate criteria for prioritising applications for access to the human biological materials.

7.H The terms of access for researchers to the whole or a part of the database(s) of an HBGRD should be set out in an access agreement.

7.I Where a HBGRD intends to provide access to the specimens and samples collected from participants, they should develop a material transfer agreement or other agreement appropriate for that purpose.

7.J HBGRDs should only transfer specimens and data when there are adequate standards in place regarding privacy of the participant and confidentiality of the data, safety and good laboratory methods and in accordance with applicable law and regulations.

7.K Access by third parties to a HBGRD may be restricted or excluded on the grounds of regulatory requirements.

Best Practices

- 7.1 HBGRDs should require that access requests include a scientifically sound and ethically appropriate research plan. Evidence of scientific peer review and ethical approval may be required to demonstrate this.
- 7.2 In certain jurisdictions, the HBGRDs may be required by law to provide access to human biological materials and data to specific third parties, such as law enforcement agencies. The HBGRDs should have a clearly articulated policy on the circumstances under which they would provide access to human biological materials or data to law enforcement agents and this should be clearly explained during the informed consent process.
- 7.3 The HBGRD should have in place a data access plan, which includes consideration of data security and confidentiality.
- 7.4 While HBGRDs may choose to have stratified access or fee policies, they should ensure that such policies are fair, transparent and do not inhibit research.
- 7.5 Different mechanisms should be employed to ensure that researchers are not inadvertently provided access to potentially identifying data, including, for example, by only permitting the querying of the database by HBGRD staff who return the aggregated results to the researcher or by permitting researchers to query only certain aspects of the data held by the HBGRD. Users of data should sign confidentiality agreements.
- 7.6 Consistent with the terms of participation, participants should only be re-contacted through a representative or designee of the HBGRD trained in dealing with sensitive issues and impartial in regards to the outcome of the research. HBGRDs should have in place policies and procedure for ensuring that such re-contacting is not unduly burdensome for participants.
- 7.7 HBGRDs that support numerous research projects should make information publicly available on the different projects.
- 7.8 An independent committee should review the plan for data access and data distribution to make sure it is consistent with the informed consent provided by the participant.
- 7.9 HBGRDs releasing human biological materials and data should consider whether the results of analysis of such materials (e.g., genotypic data) should be returned to the HBGRD and how access to such results for further research should be managed, particularly if the results can be linked to other information about the participant.
- 7.10 HBGRDs should possess the resources necessary to develop and support access procedures, to disseminate information about the contents of the HBGRD to potential users, to prepare data and specimens for release, to administer data access and material transfer agreements, and to handle any data or results that are returned by users.
- 7.11 Requests for access to human biological materials and/or data should be assessed in light of the HBGRD's objectives, participant's interest and to ensure that the proposed uses are scientifically and ethically appropriate and consistent with applicable policies, frameworks and legislation.

8. *Qualification, Education and Training*

Principles

8.A The HBGRD should ensure that all of its personnel are knowledgeable about its goals and mission.

8.B The managing person(s) of the HBGRD should be qualified by training and experience to carry out its mandate.

8.C The managing person of the HBGRD should ensure that personnel have the appropriate professional qualifications that meet recognised standards, underpinned by experience, education and training and are assigned responsibilities commensurate with their capabilities.

8.D The managing person(s) of the HBGRD should develop and implement employee training programmes.

8.E Technical staff should be responsible for implementation of policies and procedures as established by the managing person of the HBGRD.

Best Practices

8.1 In light of the importance of ensuring appropriate and up-to-date knowledge of staff, training should be carried out in line with the frequency required by applicable domestic law and taking into account international legislation, regulation and practice.

8.2 Training should form an integral part of a HBGRD's quality system and should be part of its quality manual.

8.3 The HBGRD should employ professional and technical staff with the appropriate competency to operate the equipment effectively.

8.4 A HBGRD should ensure that its curator fulfils minimum requirements in regards to education, training, experience and skills.

9. *Custodianship, Benefit-sharing and Intellectual Property*

Principles

9.A HBGRDs should have a clearly articulated policy on whether participants retain any rights in the human biological materials and data, and the nature of these rights.

9.B Where the HBGRD intends to retain rights to the participant's human biological materials and/or data, it should have a clearly articulated policy, which should be explicitly indicated to the participant and should be included in the consent document(s). Such policy should be consistent with applicable law, and regulatory and ethical best practices.

9.C Benefits arising from research using the HBGRDs resources should be shared as broadly as possible. Benefits may be shared in different ways including the sharing of information, licensing, or transferring of technology or materials.

9.D The HBGRD should have a clearly articulated policy on whether research results will be added to the HBGRD to build it as a resource for research.

9.E The HBGRD should ensure that the general results of research conducted using the HBGRD's resources, regardless of outcome, are made publicly available either in the form of publications or through other means.

9.F The HBGRD should have a clearly articulated policy on whether or not it intends to commercialise any resources, such as the human biological materials, data, information or the database(s), and the modalities of such commercialisation. This policy should also explicitly set out whether participants will derive any benefits from the commercialisation. It is important that this information be communicated to participants during the informed consent process or in a timely manner.

9.G The HBGRD should inform participants that commercial products may arise from research conducted using its resources. It is important that this information be communicated to participants.

9.H The HBGRD should have a clearly articulated policy in regards to intellectual property rights and this should be made publicly available for participants in a timely manner.

Best Practices

9.1 In recognition that the sharing of knowledge is one of the most important benefits to be derived from HBGRDs, they should endeavour to foster the exchange of information and research.

9.2 The sharing of benefits should encourage appropriate access to and use of human biological materials, data, and information and, as applicable, through building resource capacity or expertise in non-OECD economies.

9.3 HBGRDs should develop a clear policy on whether tests or products arising from research using its resources might be shared with the community and/or the general population, and how such sharing will be effected.

9.4 Where appropriate, HBGRDs should have a system where benefit sharing agreements can be negotiated before a study begins, especially in the case of population-level studies where there may be vulnerable populations or unique concerns.

9.5 Researchers should submit to the HBGRD an annual progress report and a report at the termination of a research project. Such reports should list publications, patents filed, and patents issued arising from research accessing the HBGRD's resources.

9.6 Aggregate results arising from research conducted using the HBGRD's resources may be made available in easily accessible forms, including a newsletter or website.

9.7 Researchers should acknowledge in publications, presentations, and, where relevant, patents filed the HBGRD whose resources they have used or relied on.

9.8 The HBGRD should provide to researchers using its resources detailed guidance on the manner in which it wishes to be acknowledged.

10. *Demise of the HBGRD and Disposal of Materials and Data*

Principles

10.A The HBGRD should plan for an unforeseen demise, such as the end of its funding.

10.B The initiators of a HBGRD should consider a possible end date for this endeavour.

10.C In accordance with applicable law, a HBGRD should have a detailed policy setting out the manner in which the human biological materials and data that it holds will be dealt with in the event of its demise.

10.D Once a HBGRD is no longer required or is no longer of scientific value, the human biological materials and data should be disposed of in an appropriate way, consistent with the principles of consent and privacy.

10.E Where applicable, the HBGRD should dispose of human biological materials in accordance with legislation and regulation applicable to the disposal of human materials and bio-hazardous waste.

10.F The HBGRD should ensure that all information and data it holds is destroyed in a manner not permitting its recovery and in accordance with the state of the art and technology.

10.G The HBGRD should destroy all information and data that it holds in accordance with legislation and regulation, including that applicable to the protection of the privacy of the participant.

Best Practices

10.1 The HBGRD should develop detailed plans for the appropriate disposition or destruction of the human biological materials and data should the HBGRD no longer meet a continued scientific need.

10.2 In the event that a HBGRD can no longer be financially supported, every effort should be made to transfer the materials and data to another initiative or to another entity.

10.3 Where the demise of the HBGRD results from insolvency, the liquidator will be governed by applicable insolvency law. The initiators of the HBGRD should be aware that the liquidator may be permitted or required to sell the assets of the HBGRD to commercial buyers, subject to any constraints in the participants' consent or under the law. The initiators should consider what steps should be taken to provide for this and make information available to participants about the issue.

10.4 Disposal techniques and procedures should be consistent with health and safety legislation and regulation.

10.5 The HBGRD's policy on the destruction and disposal of human biological materials and data should take into consideration cultural heritage and/or religious beliefs known or disclosed by the participants, and their representative groups.

ANNOTATIONS

Introduction

1. The aim of these Guidelines is to provide guidance on the establishment, governance, and management of Human Biobanks and Genetic Research Databases (HBGRDs).
2. For the purposes of these Guidelines, human biobanks and genetic research databases (HBGRDs) are structured resources that can be used for the purpose of genetic research, which include: a) human biological materials and/or information generated from the analysis of the same; and b) extensive associated information. For example, HBGRDs could include large-scale collections of human biological material representative of a population or part of a population, epidemiological collections, collections of carriers of specific genetic mutations/markers/profiles, collections of individuals taking specific medications.
3. While there are many diverse collections, it is recognised that the principles and best practices set out herein may not be applicable to all of these. For example, the principles and best practices set out herein may not apply to resources established principally for non-research purposes, such as for diagnosis, therapeutic, treatment, forensic, transplantation, transfusion, audit, public health surveillance, quality assurance purposes or as teaching materials. Similarly, while there will be many useful principles and best practices in these Guidelines that may be applicable to single researcher/small group/small collections, it may be the case that some of these principles and best practices may not be feasible. For example, some principles and best practices may not be feasible for an individual researcher studying a rare disease with a few families and samples.
4. HBGRDs established solely to support drug development with the objective of obtaining marketing authorisation of a medicinal product or a medical device are not contemplated within these Guidelines.
5. It is recognised that existing/old collections may have great scientific value and may be employed for research purposes different than those originally contemplated. Nevertheless, such collections may have been established in the accordance with the legalisation, regulation, and policies of the time, which may be different from those currently applicable. While these Guidelines are intended to be applicable to these existing/old collections that are being re-used today, it is recognised that the application of some of the principles and best practices may not be feasible.
6. The OECD has also developed *Best Practice Guidelines for Biological Resource Centres (BRCs)* which target quality assurance and technical aspects that should be addressed by BRCs to ensure the supply of high quality biological materials.
7. A number of international legal instruments provide some context for issues pertaining to human genetics and research on human subjects, some of which are referenced here. The UNESCO *Universal Declaration on the Human Genome and Human Rights* (1997) declares that the human genome is the common heritage of humanity and that the human genome in its natural state shall not give rise to financial gains. The *Universal Declaration* deals with the human genome in its natural state. The *Helsinki Declaration of Ethical Principles for Medical Research Involving Human Subjects* (1964, 1975, 1983, 1989, 1996, 2000, 2002, 2004) provides guidance to physicians and other participants in medical research involving human subjects, including research on identifiable human material or identifiable data. The *Convention on Human Rights and Biomedicine* (1997) adopted by many member countries of the Council of Europe deals primarily with protection, especially of human rights, in the context of the application of

biology and medicine. The Council of Europe also adopted the *Recommendation 2006(4) on Research on Biological Materials of Human Origin* which applies to research activities in the health field involving the removal of biological material of human origin to be stored for research use. Within this Recommendation, there is also a brief section on population biobanks. The HUGO Ethics Committee's *Statement on Human Genomic Databases* (2002) also provides principles that are of relevance.

1. HBGRDs Generally

8. Principle 1.A recognises that the one of the fundamental objectives of a HBGRD should be to encourage and foster research, recognising that research resources built on the donations of research participants should be used as effectively as possible so as to advance knowledge and understanding. Implicit in this principle is the presumption that it is potentially beneficial research that should be encouraged and fostered. Another fundamental objective of a HBGRD should be to respect the rights of research participants.

9. These Guidelines encourage the rapid and wide dissemination of human biological materials and data. However, it is also recognised that in some cases, such as proprietary databases, the data collected cannot be widely and rapidly disseminated.

10. The establishment of a HBGRD may require the expenditure of considerable financial and human resources from public sources as well as private sources. This spending of resources will often begin well before the actual creation of the HBGRD. In order to effectively use limited research funds, the scientific and financial feasibility of the HBGRD should be assessed as early as possible. Projects that do not serve a scientific need should be halted as early in the development process as possible.

11. The HBGRD will follow domestic legislation, regulation and policies and in many cases will also follow international practices, guidelines or frameworks. Pertinent information about key instruments should be made available publicly and in a non-legalistic manner. This could include information about instruments covering areas such as research involving human subjects, privacy, *etc.* As the legislation, regulation, policies, frameworks, *etc.* are modified, the HBGRD should have in place a means for updating the information that is made available.

12. Research pertaining to a large portion of a population, especially sharing a number of common characteristics, may raise issues of potential discrimination and stigmatization. For example, a particular correlation between a specific heritage and a particular disease may lead to discrimination from, for example, employers or insurers. The initiators and managers of the HBGRD should be cognisant of such potential consequences not only for participants but also individuals, families and groups who have not participated. It should be disclosed that individual or population-based human genetic data may have repercussions on a participant, his/her family, a group he/she is part of and his/her community as a whole. Depending on how the data might be used, these repercussions may include but are not limited to possible insurance and employment difficulties as well as loss of dignity.

13. The establishment of an HBGRD will involve expending considerable resources both prior to and in the course of its establishment. In order to ensure that resources are expended usefully, the initiators of the HBGRD should develop a business plan and strategy for the HBGRD, which should take into account and set out the economic, financial, and scientific feasibility and viability of the HBGRD. The business plan and strategy should set out the assumptions and risks inherent to the establishment of the HBGRD.

14. The initiators should provide information on the scientific rationale underlying the intended HBGRD, as well as the scientific and business risks. The initiators should provide information to

participants about the possibility that the purpose and scope of the HBGRD's research may evolve over its lifespan. It may occur that scientific findings can prove, for example, that the materials collected are no longer suitable for the rationale underlying the HBGRD. An example is where a HBGRD may decide to collect samples for DNA isolation, but later on determine that RNA may be required to pursue its scientific rationale. The need for RNA was scientifically not foreseeable at the time of the specimen collection. The initiators may not be able to provide information on such scientific risk at the time the HBGRD is established. In such circumstances, a HBGRD may refer to the continuous development of new technologies and new scientific findings which will require continuous adaptations/modifications of the HBGRD during the course of its existence.

15. In regards to business risks, initiators may choose to highlight for participants that there will most likely be changes over the lifespan of the HBGRD. Examples of areas where change may occur include in regards to ownership of the HBGRD. For example, over the lifespan of a HBGRD, public enterprises/universities may become privatized or vice versa. A HBGRD should provide information that ownership could change and explain the uncertainties associated with the establishment and operation of the HBGRD.

2. Establishment of HBGRDs

16. The need for and extent of consultation will be determined by the purpose, nature and type of HBGRD. Determining the breadth of consultations will be influenced by the risks involved in sharing human biological materials and data and the sensitivity of the data being collected. The greater the breadth of targeted participants as well as the information and data collected by the HBGRD, the more important that broad consultations be carried out and with diverse groups. For example, stakeholders to be consulted in the course of the establishment of the HBGRD may include potential participants, representatives from the public, patients groups, industry, government, and the research community. Such consultations may assist in communicating information about the nature, purpose, and scope of the HBGRD as well as in identifying needs and concerns. However, HBGRDs should guard against inflating the future and potential benefits of the HBGRD itself, and of participating in the HBGRD.

17. Consultations may be carried out through a diversity of approaches and more than one approach may be used in the course of consultations. For example, consultations may be carried out through focus groups, surveys, interviews, and web-based discussions. Moreover, consultations should aim to cover a variety of issues. For example, scientific, legal, regulatory and ethical subjects, especially where concerns have been identified, should be covered.

18. Some HBGRDs may be established in collaboration with private sector entities, for example to diversify their sources of funding. Additionally, it may be within the contemplation of the initiators that the HBGRD could be involved in collaborations with commercial undertakings. In the event that such activities are contemplated, the HBGRD should clearly communicate this to potential participants at the earliest possible opportunity. While many participants may be indifferent as to whether or not the HBGRD will be involved in commercial activities, some participants may choose not to participate in the HBGRD in such circumstances. For example, survey evidence from one jurisdiction found that citizens were less likely to participate or contribute where foreign companies were involved in the HBGRD.

19. The best practices indicate that the HBGRD should publicly make available information on the financial model that it intends to adopt over its lifespan in order to ensure its sustainability. This could, for example, include information on the business plan both for the short term (*e.g.*, for 5 years) as well as more long term planning.

3. Governance, Management, and Oversight

20. The principles mention appropriate oversight mechanisms for ensuring its governance and compliance with the applicable law, regulation and policies. There are many models of mechanisms and they may carry out different functions. For example, there may be scientific oversight or ethical oversight. The different models may include, for example, institutional review boards, ethical review boards, scientific peer-reviewed committees, scientific advisory committees, *etc.*

21. The Principles state that oversight bodies of HBGRDs should include expertise from diverse relevant fields, as well as representatives from different stakeholders. Expertise may be drawn from various medical and scientific specialities such as genetics/genomics, epidemiology, as well as other fields such as law, ethics, accounting, *etc.*

22. Participants should be able to have recourse to independent bodies for redressing breaches of the applicable ethical and regulatory framework. The independent bodies may be established solely for the purposes of addressing breaches by the HBGRD or may be existing bodies, such as judicial courts.

4. Terms of Participation

23. The fundamental precept of prior, free and informed consent forms the basis for the involvement of human subjects in medical and scientific research. Nevertheless, there are limited circumstances where the waiver of the requirement for informed consent can be justified. In some countries, such cases arise when it is impossible or highly impracticable to obtain consent, the expected public benefit is high, the risk to the participant is deemed minimal, and the rights and welfare of the participant are not adversely affected. In such cases, the informed consent may be waived by an authorised entity such as a research ethics committee.

24. While the informed consent process will often be associated with individual consent, it should be recognised that different cultures view decision-making differently. For example, within certain cultures it is more common that decisions are made at the community or group level rather than at the individual level. This has implications for the consent process as well. When involving different cultural groups, researchers should be cognisant and respectful of the need to obtain community or group consent, in addition to individual consent, as applicable.

25. The Principles and Best Practices indicate that recruitment of participants should be carried out in an unbiased manner. There are different approaches to ensuring non-bias during the recruitment process. One of the ways is for the person carrying out the recruitment to be different from and independent from the lead investigator. It should always be made clear to the potential participant that agreement or refusal to participate will not have any effect on any medical care that will be or could have been provided to them.

26. Initiators should view consent as an ongoing process rather than a formal document or a one-time decision. Moreover, HBGRDs should endeavour to use as many communications tools as are feasible to communicate information about the purpose, nature and scope of the HBGRD, and other information in order that the consent process is as informed as possible. Often more than one means of communication may be employed. For example, HBGRDs may wish to provide background information through leaflets, provide information sessions, and provide the opportunity for individual meetings with counsellors. While as much information about the consent form as possible should be made publicly available, it is recognised that for certain HBGRDs, there may be protected or proprietary information in the form that cannot be

rendered public. While this consent form will of course be disclosed and discussed with the potential participant, it may not be made publicly available.

27. The goal of the informed consent process should be to provide information in a simple and easily understandable manner to the potential participant. During the informed consent process, it is important that participants should be provided with information on a variety of subjects. Depending on the nature of the HBGRD, these may include:

- The purpose of HBGRD and foreseeable risks and benefits of taking part.
- The types of human biological materials and data that will be collected at enrollment, which may include data that some participants consider especially sensitive (with options to avoid certain questions and measurements), and may be linked to health and other records.
- Where applicable, the fact that the HBGRD will be the legal owner of the human biological materials, data, and the collection, and that participants may not have proprietary rights in these.
- The intended use of human biological materials and data.
- The procedures and safeguards used to protect confidentiality and privacy.
- The policy with respect to benefit sharing.
- Where applicable, the expectation that commercial entities will apply to use the HBGRD's database(s).
- The policy and means for ongoing communication with participants.
- The information for contacting the HBGRD.
- The policy with regards to sharing human biological materials and data with third parties such as insurers, employers or law enforcement agencies.
- The policy in terms of feedback of results to participants.
- The policy with respect to re-contact and the purposes for which such re-contact will be undertaken.
- The policy applicable to the use of human biological materials and data of a participant in the event that they become incapacitated or die.
- The storage and period of storage of the human biological materials and data.
- Their right to withdraw, the nature and modalities of this right and how to exercise this right.

28. The informed consent process should include information on the human biological material and data to be collected, their intended uses, storage, transfer and their disposal techniques. In addition, this information should take into consideration the participant's cultural and/or religious beliefs.

29. While the goal of the informed consent process should be to provide as much information as is relevant, the informed consent document should remain as straight-forward, readable and accessible as possible. Considerations should be given to the needs of participants especially for those who are less educated, elderly, or who are not native speakers. Where relevant for the potential participants, the informed consent document should be translated into their native language/mother tongue. For example, for a HBGRD collecting human biological materials and data from a specific community whose mother language is not the official language of the country, it may be desirable to translate the document into the mother language of that community.

30. In the informed consent process, participants should have the opportunity to meet with HBGRD staff in order to discuss the nature and scope of the HBGRD. Where for reasons of confidentiality, the HBGRD's staff may not meet with participants, such participants should be provided with the opportunity to discuss with appointed designees. The HBGRD should ensure that such meetings are fair and neutral and do not, either directly or indirectly, create the potential for participants to feel pressure to participate in the HBGRD. HBGRDs should ensure that potential participants are not placed under rushed time-constraints for providing their consent. As well, HBGRDs should remind potential participants that their refusal to participate will not result in sub-optimal care or discrimination of any kind.

31. The common practice is to obtain the informed consent from the participant. However, in certain circumstances, it may not be possible to obtain the consent of the participant. In such cases, HBGRDs may wish to provide for the possibility of obtaining the informed consent from the appropriate substitute decision-maker. For example, if a potential participant is not legally capable to provide consent the substitute decision-maker may provide such consent, subject to the requirements of applicable law. A person may be incapable of providing consent, for example, due to age or mental incapacity.

32. The HBGRD should also develop a policy with respect to the treatment of the human biological materials and data of a participant who becomes legally incapacitated or dies. There are a variety of approaches on how these situations may be approached. It is essential that the HBGRD provide information on their policy to the participant or the appropriate substitute decision-maker at the time of consenting. Some HBGRDs make explicit to participants during the consent process that their data and samples will continue to be included in the HBGRD after they lose capacity or die. Other HBGRDs may wish to offer the option for participants to be withdrawn, by a next of kin or close friend (possibly someone named by the participant during the consent process), from a study after death or loss of capacity. Some HBGRDs may wish to indicate that participants' data and samples will be irreversibly anonymised at the point at which their death becomes known to the HBGRD. HBGRDs should also consider whether they will reassess mental capacity during any re-contact of a participant and/or what the effect of a participant being found to lack capacity on re-contact will be (e.g. whether further data or samples might be collected thereafter, and whether the fact of their incapacity will be recorded and included in the research database).

33. HBGRDs should provide the right to withdraw to participants and inform them of this right at the time of consenting. However, in some situations, the right to withdraw may be circumscribed, and participants should be informed of this as well. For example, if samples have been anonymised or distributed, or if results are in the public domain or have been published, complete withdrawal may not be possible. Participants need to be informed about these situations. However, participants should also be reassured that complete confidentiality and protection of their specimens, samples and data will continue. Participants should also be provided with contact information in case they wish to withdraw at any time.

34. HBGRDs should have a clear articulated policy on the nature of feedback, if any, that will be provided to participants. For example, in exceptional cases participants may be provided individual research results. As well, feedback may also constitute generalised research findings. These may be provided in the form of the publication of results of research. Feedback may be provided through various formats including for example, newsletters, websites containing research summaries, and lists of publications. More than one approach may be used.

35. There are numerous options for a participant exercising their right of withdrawal. For example,

- a) "No further contact" - no further contact with the participant, but permits the continued retention and use of the previously obtained specimens, samples and data, and if applicable, linked to records from third parties.

- b) “No further use” - no further contact with the participant, no further collection of specimens or data, and destruction or irreversible anonymisation of all specimens, samples and data.

At the time of consenting, participants should be informed of the various options.

36. Whether for the consent process or for providing information on research results, the various means of communications should be considered. Moreover, efforts should be made to employ the most environmentally-sound and cost-efficient means of communications. For example, this could include information via websites, TV, blogs, SMS, *etc.* However, decisions on the communications approaches to be employed should also take into account the diversity of the targeted audience. For example, consideration should be given to technology issues (*i.e.*, paper versions of the documents should be made available especially for those who are not familiar with technology), language issues (*i.e.*, do the documents need to be translated into a language of a large segment of the population, even if it is not an official language) and diverse challenges. For example, information may be more accessible for some portion of a population if made available in video format, and it may be more accessible for the visually impaired if converted into Braille script. Moreover, communication strategies should also take into account the consent process for children.

37. As many HBGRDs will be longitudinal in nature, situations may arise over the course of the HBGRD’s operation, where re-contacting participants becomes important. For example, it may be that the HBGRD intends to carry out significantly different research than that originally contemplated; or it may be that new information about disease diagnosis becomes available. Participants should be provided, at the time of consenting, information pertaining to re-contact. For example, they should be informed of the circumstance under which they will be re-contacted, whether re-contact is obligatory for participation in the HBGRD, and by whom they will be re-contacted.

38. Where substitute consent has been obtained from a participant lacking capacity (*e.g.* a child), consideration will need to be given to what happens once the participant gains or re-gains capacity to consent (either as an adult or a competent minor). Consent will need to be obtained from the participant to collect further data or human biological materials from them. Particular care will need to be given to respecting the individual privacy of each participant where children have been recruited into family studies.

5. Contents of HBGRDs

39. HBGRDs should have a clearly articulated policy on the human biological materials and data that they will collect from each participant and store in the database. This policy should also cover the diverse types of data elements that will be collected, details about the quantity and quality of the specimens and/or data to be collected, and whether there will be direct or indirect links to identifying information. For example, the HBGRD could provide information about the type of specimens that will be collected: blood, urine, hair, *etc.* specimens. The HBGRD could also indicate the quantity of each type of specimen that will be collected. For example, the CARTaGENE initiative indicates that the participant will provide sixty 60 ml (4 tablespoons) of blood through standard blood collection, that the participant’s DNA and plasma will be extracted from the sample in order to evaluate the different components and elements in their blood, such as glucose levels and haemoglobin.

40. The HBGRD could also provide information about what data, information or sample will be derived from the specimen, if any, or whether immortalised cell lines will be generated. Moreover, the HBGRD should provide an explanation to participants of how the human biological materials will be

employed. The HBGRD should also communicate to the participant the medical, personal and genetic information that will be collected.

41. HBGRDs may choose to not include certain data, to not perform certain tests and to not allow certain types of analyses. The HBGRD should have a clearly articulated policy about which specific types of data will not be collected and which specific types of tests will not be performed. For example, the HBGRD could indicate that it will not carry out tests for nor collect information about paternity, HIV/AIDS, or the use of illicit substances, where this is the case.

42. Different cultural and religious groups have diverse attitudes to biological material, and these can change over time. HBGRDs should take these into account, where they are known, and consider whether any steps should be taken to ensure those views are respected. Some groups regard certain types of biological material as having a special status, particularly where it is removed post mortem, and as deserving of special treatment *e.g.* in terms of the method of its disposal. Although this is most likely to be addressed during the consent process, there may be circumstances where this is not the case (*e.g.* in the case of existing collections).

6. Protection of Human Biological Materials and Data

43. Within the research community it is commonly-agreed that certain uses of participants' human biological materials and data are inappropriate. It is important that human biological materials and data be collected in a manner that permits their use and sharing by researchers. International standards are being developed to facilitate the linkage of datasets and the interoperability of systems so as to foster research and the sharing of data and materials.

44. Human biological materials and data protection may be achieved via different approaches and mechanisms, and often through the combined use of various approaches. Some examples include, the coding and encryption of human biological materials and data; limiting access to the collection of human biological materials and data; implementation and maintenance of security measures to block unauthorised access; data enclaves, honest broker systems, *etc.* In the event that human biological materials and data are collected by various partners, then each partner holding these could use their own code with none of them holding the totality of the codes. Honest broker systems involve independent third parties who are responsible for ensuring the separation of identifying information from other data. An honest broker system may be, for example, a data protection authority. Data enclaves involve the use of secure or controlled access databases or websites. These allow the HBGRD or a third party to physically and electronically control and monitor the use of the HBGRD's database(s) by external users to ensure it complies with the terms of access and it conformant with the participant's consent.

7. Access

45. During the consent process, HBGRDs should provide information to participants on whether human biological materials or data will be made available for non-research purposes. For example, human biological materials or data may be made available for non-research purposes such as proficiency testing. Similarly, HBGRDs should have a policy on whether they will make available human biological materials or data to insurers, employers or law enforcement agencies.

46. Depending on the nature of the resource, the data/ sample provider and the end user, access agreements (including data access and material transfer agreements) may address some or all of the following:

- What is to be provided (specification of data and materials, format and timing of release);
- What the data and materials provided can be used for (this is often limited to a specific project), and what they can't be used for (this may be everything other than the specified project, or something more specific (*e.g.* data linkage);
- The credentials of the end user;
- Fees (or royalties) payable;
- Arrangements concerning intellectual property rights (*e.g.* whether or not IP rights are asserted by the provider over existing or future IP, or any licences sought by them to future IPR);
- Requirement to return research findings to the resource owner to enrich the resource;
- Requirement to publish research findings and/or to disseminate them more generally, and to acknowledge the resource in publications;
- Requirement to act in accordance with participants' consent, and any procedures in the event of withdrawal of consent;
- Requirement to act in accordance with relevant legal and regulatory requirements, and obtain ethical approval (where applicable);
- Requirement to preserve confidentiality, and/or maintain anonymisation (and not attempt to re-identify or re-contact participants);
- Limits on (prohibition of or additional safeguards required for) transfer of data or materials to third parties, including cross-border;
- Disclaimers of responsibility for data/ sample quality;
- Return or disposal of residual samples at the end of a project;
- Termination (*e.g.* for default);

47. The transfer of human biological materials and data outside the geographical jurisdiction where they were collected raises numerous complex issues. While most jurisdictions will have some applicable legislation, regulation and policy, there may still be lacunae and more specific legalisation, regulation and policy may be required.

48. HBGRDs may adopt stratified policies in regards to access to its resources or to the payment and amount of fees. These policies may be based on a number of criteria, including for instance the background or affiliation of the researcher. For example, some HBGRDs will charge a fee for researchers from the private sector but not to researchers from public universities or public labs.

49. Where human biological materials are physically released to third parties by the HBGRD, consideration should be given to the implications for the custodianship of any data derived from the analysis of such material that relates directly to participants (*e.g.* genotype data derived from DNA), particularly where such data can be linked to significant amounts of phenotypic data about the same participant. It may be appropriate in order to ensure the privacy interests of participants are respected to manage the use of data that are so derived centrally through the governance mechanisms established by the

HBGRD. This can be achieved through the terms of MTAs which govern the release of the human biological materials from the HBGRD to the researcher.

8. Qualification, Education and Training

50. [Please provide text if you consider that there should be Annotations on this section of the Principles and Best Practices.]

9. Custodianship, Benefit-Sharing and Intellectual Property

51. Section 9 of the Guidelines provides guidance on issues pertaining to custodianship, benefit sharing and commercialisation.

52. The HBGRD should have a clear policy on who will retain rights to human biological materials and data, and on the nature of these rights. Its policy will depend on a number of factors, including the applicable domestic law. Where the HBGRD intends to retain certain rights, it should inform the participant. The participant should be provided, in an understandable manner, with information on the nature of the rights that the HBGRD will retain and its consequences. In situations where the participant retains any rights, these should also be explained in an understandable manner.

53. The establishment and broad use of HBGRDs will contribute to the scientific community's pursuit and understanding of disease etiology. HBGRDs will provide access to greater resources and therefore contribute to the development of more specific results. To achieve this objective, the HBGRD should strive to ensure that general results arising from research conducted using its resources be added back into its database(s) in order to continue to build itself. A HBGRD should also encourage the dissemination of general research results.

54. Over time, benefits will arise from the establishment of HBGRDs. Benefits may include, but are not limited to, contributions to the advancement of science, the development of new diagnostic and therapeutic tools or products, or capacity-building, whether in OECD member countries or non-member economies. In recognition that the sharing of knowledge is one of the most important benefits to be derived from HBGRDs, they should endeavour to foster the exchange of information, technology and research. Information, technology and research may be carried through various means including through technology transfer, material transfer, licensing, joint development activities, *etc.* The *OECD Guidelines for the Licensing of Genetic Inventions* (2006) provide guidance so as to ensure that licensing and transferring agreements as well as joint development activities are carried out in a balanced manner and are based on economically rational practices that help eliminate high transaction costs and that serve the interests of society. Benefits resulting from the HBGRD activities and their applications should be shared as much as possible with donors, communities and society as a whole.

55. The HBGRD should develop a detailed policy of whether or not it intends to commercialise any resources, such as the human biological materials (*e.g.*, specimens, samples), data, information or the database(s). It is important that this information be communicated to the participant during the informed consent process. This policy should also explicitly set out whether participants will derive any benefits from the commercialisation.

56. HBGRDs should also develop a clear policy on any intellectual property rights that may arise, either directly or indirectly, from the use of the HBGRD. For example, the policy may set out to whom these rights accrue, and who will ensure their protection or enforcement, if necessary. Similarly, there may

be IP rights that arise pursuant to the research that is carried out using the human biological materials and data obtained from the HBGRD. The policy should clearly set out the policy with regards to such rights. For example, one approach would be that any IP rights arising from the research belong to the researcher or their employers.

57. The Best Practices set out that researchers should acknowledge in their publications, presentations, and patent filings, as appropriate, the HBGRD whose resources they have used or relied on. It would be useful for a HBGRD to develop a policy on the manner in which such an acknowledgement should be indicated. They may wish to provide specific guidance on the manner in which they wish to be acknowledged.

58. Where the HBGRD has been developed with input from researchers from resource-poor settings, it may also be appropriate for the users of the resources or the initiators of the HBGRD to identify ways in which the contributors can be supported (e.g. through the exchange of knowledge or know-how to develop research capacity in such settings).

10. Demise of the HBGRD and Disposal of Materials and Data

59. HBGRDs should develop plans for the appropriate transfer, disposition and destruction of human biological materials and data where it is no longer scientifically or financially feasible. While the destruction of specimens and samples under the control of the HBGRD may be more straight-forward, ensuring the destruction of specimens, samples and data that have been provided to third parties may be difficult. The destruction of all data may also be quite difficult given that “back-up” files may cover a lengthy period (for example, 30 years). While HBGRDs should make every effort possible to retrieve and destroy all of the data, there may be circumstances where this is not feasible (e.g., if pooled samples are prepared or cells lines have been developed and disseminated anonymously). Such information will need to be provided at the time of explaining about the right to withdraw. Moreover, the HBGRD should have policies and procedures in place for ensuring appropriate disposal of potentially bio-hazardous materials.

GLOSSARY

The following definitions are provided for ease of reference. Some of these definitions are drawn from commonly used international documents and do not represent an effort by the OECD to agree on interpretations of these definitions or develop new ones.

Assent – Herein this term is used in the context of a child participant in research. It implies an act involving understanding. Even though a child may not be considered legally competent to consent to participate in research, the child may be considered competent to give his/her assent, that is – their opinion on whether they wish to participate in the research.

Associated Information - personal, clinical, biochemical and phenotypic information about the participant.

Anonymised – no link between the participant's personal identifiers and the human biological materials and associated data. To anonymise data, coding keys are deleted such that there is no possibility to trace back to the participant. [EMEA, 2006]

Double-Coded - To double code data two coding keys are employed so as to ensure additional protection of privacy and confidentiality, but a link back to the participant's personal identifiers is possible. [EMEA, 2006]

End-User - A health care practitioner, scientist, or laboratory personnel who performs an appropriate procedure, test or archival function for the specimen.

Governance - the processes and structures that an entity uses to set its objectives/goals, appoint the management whose responsibility it is to achieve these goals and to oversee management in its pursuit of these goals. Governance mechanisms are also needed to put in place internal controls and risk management systems. Management is accountable to the governance bodies that in turn are usually/should be accountable to those who have appointed them.

Human Biological Material – includes specimen, samples and aliquots.

Identifying information (identified) – information that may directly lead to identifying individuals from whom the human biological material and associated information are collected as there is a link between the participant's personal identifiers and the data.

Initiators – the researchers, governmental entities and/or organisations involved in setting up the HBGRD.

Informed consent - A process by which information concerning the donation process is presented to the participant or participant's substitute decision-maker with an opportunity for them to ask questions, after which specific approval is documented.

Management - comprises directing and controlling a group of one or more people or entities for the purpose of coordinating and harmonizing that group towards accomplishing a goal. Management often encompasses the deployment and manipulation of human resources, financial resources, technological

resources, and natural resources. Management is responsible for achieving the objectives/goals set for the organization and is given considerable leeway to undertake this task. While this may be operationally efficient, there is a possibility that management might act only in their own interests, hence the need for governance mechanisms.

Material Transfer Agreement – generally signed between a provider and a recipient, is used to document the transfer of materials, with or without information, either to an entity (*i.e.*, the recipient) and/or away from an entity (*i.e.*, the provider) subject to a number of terms and conditions.

Oversight - is based on the notion that there is usually a difference between setting policy and objectives for an entity and overseeing or monitoring how these are being executed or put into operation.

Participant - Individual who is the source of the specimen in accordance with established medical criteria, procedures and practice and in compliance with privacy regulations.

Private entity - may cover for-profit entities but may also cover legal entities not publicly held or traded.

Private-Public Partnership (PPP) - is a cooperative venture between the public and private sectors, built on the expertise of each partner and involves the allocation of resources, risks and rewards.

Research Ethics Committee (REC) - is a local authority that evaluates research projects involving human beings, including genetic research. The primary function of a REC is to protect the welfare and rights of human participants in research. Depending on the jurisdiction, these may also be referred to as Ethics Review Board (ERB) or Institutional Review Board (IRB).

Sample - A single unit containing material derived from one specimen.

Specimen - A specific tissue, blood sample, urine sample, *etc.* taken from a single donor at a specific time.