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## Ethical Principles for Research Governance of Biobanks

### Introduction

Biobanks of collected human tissue samples are rapidly expanding and becoming „essential tools in translating biomedical research into real improvements in health care”<sup>1</sup>. Biobanks are rich sources for genetic research. The German National Ethics Council<sup>2</sup> has noted, for example, the potential of biobanks for the identification of causes of disease and for breakthroughs in medical and pharmaceutical research. Unsurprisingly, many pharmaceutical companies operate biobank collections for research purposes and to enrol suitable clinical trial recruits so as to minimise side effects and achieve better results. Biobanks are also essential tools for conducting large-scale epidemiological studies, involving whole populations (with the neologism „epigenetic”). One commentator has noted that biobanks are invariably ”staggeringly expensive”<sup>3</sup>

At the international level, the successor to the Human Genome Project, the International Haplotype Mapping Project is a collaboration between the USA, UK, Japan, Nigeria China and Canada to identify and compare genetic similarities and differences in collected human tissue samples to find genes that affect health, disease and medication responses.<sup>4</sup> Another international collaboration is emerging in the Public Population Project in Genomics (P3G)<sup>5</sup> that aims to link many national biobanks in a not-for-profit initiative to provide a public and accessible knowledge database for the international population genomics community. P3G will enable large-scale epidemiological studies to be undertaken.

There is considerable activity at the national level with the establishment of biobanks. DeCode (Iceland) was the pioneer program that has been followed by increases to the biobank family in the shapes of GenomEUtwin (Finland); Estonian Genome; Danubian Biobank Foundation (involving six countries in Central Europe); KORA-GEN (Germany); Karolinska Institutet (Sweden); CARTaGENE (Quebec,); LifeGen (Sweden); INMEGEN (Mexico); LifeLines (Netherlands); and Biobank (UK) that will enrol some 500,000 recruits. These biobanks have been specifically created for large-scale longitudinal genetic research projects<sup>6</sup>. The National Heart,

Lung and Blood Institute (NIH, USA) the Centre for Integrated Genomic Medical Research (Manchester UK) are also significant additions to the family of biobank programs.

There have been a number of biobanking developments in Australia. Around 2000, a private company, Autogen tried to establish a database in the Polynesian kingdom of Tonga. This was abandoned after controversy and highly critical media publicity<sup>7</sup>. Although, there is no formal national initiative, the state-based Western Australia Genetic Health Project has been announced with the aim at enrolling most of the State’s 1.5 million population by linking public health records with existing research databases and a prospective collection of tissue samples. A similar initiative has been reactivated in Tasmania under the leadership of the Menzies Centre for Public Health Research. In Victoria, the Peter McCallum Cancer Institute tissue bank, established in 1998, has linked up with other cancer clinics in an initiative to analyse and investigate the genetic causes of and links to cancers. The Queensland Medical Research has a major research effort based on its collection of genetic

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- 1 Genetic Engineering News Vol 25:No 3 (2005) at 1.
- 2 Nationaler Ethikrat, Opinion on Biobanks for research Berlin 2004.
- 3 H Greely quoted in R Longtin ‘Canadian Province seeks control of its genes’ (2004) 96 Journal National Cancer Institute 1567-69.
- 4 see <http://www.hapmap.org/>.
- 5 <http://www.p3gconsortium.org/> The P3G motto is ‘transparency and collaboration’.
- 6 For an account of Australian databases see D Nicol ‘Public trust, intellectual Property and human genetic Databases; the need to address benefit sharing’ (2006) 3 J of International Biotechnology Law 89-103.
- 7 See R Burton, ‘Proposed Genetic Database on Tongans Opposed’ (2002) 324 Brit Med J (7335): 443.

samples from twins. There is also an ongoing public debate about the privacy and possible use of stored 'Guthrie cards,' which are stored blood spots taken from every newborn child in Australia.

This article considers the regulation required to balance the facilitation of the increasing international linkage between biobanks with the proper protection of those recruited by the biobanks as tissue sample providers. This trend will require greater harmonisation of regulation across jurisdictions. While most biobank countries have privacy legislation, this legislation is not necessarily uniform. Harmonisation of human research ethical principles is feasible as a first step. This article proposes a set of established and emerging ethical principles to ensure public trust in biobanks in a context of an increasingly privatised and commercialised research environment.

### Some policy challenges for biobanks

There are a number of technical challenges required to facilitate the creation of an effective and ethical biobank system. First, as the work of the Rand Corporation argued<sup>8</sup> the sample collection and storage processes must be quality assured to ensure that the collection, handling, storage, processing, access and use of any samples are not tainted by human or process error. Currently, there are inconsistencies in collection, storage and access policies of biobanks. To address this, biobank networks have grown up to informally develop standardised procedures. In Australia and New Zealand, the voluntary, not-for-profit Australasian Biospecimen Network is developing standardisation advice.<sup>9</sup> Secondly, the confidentiality and privacy of the information derived from the samples must be secured. This is a technical as well as an ethical issue. In this respect, a number of privacy enhancement information technology systems (PETs) are being developed.

Apart from these technical challenges, there is a fundamental definitional question of what constitutes a biobank. The term "biobank" is largely synonymous with the term 'genetic databases' (or Human Genetic Research Databases, the term used generally by the OECD). The key ingredient of a biobank or database is the storage of human tissue.<sup>10</sup> Accordingly, genetic registers of personal and family information and histories are usually excluded as human tissue collection is, generally not required. The term 'biobanks' applies to the specifically created research collections of human

tissue listed above. However, the term may also be used to describe any other collection of human tissue for research purpose, such as, archived pathology tissue collections in public or private hospitals, forensic DNA banks, cord blood banks, bloodbanks. There are also, increasingly, specially established human tissue banks for research<sup>11</sup>. Many pharmaceutical companies have established tissue databases with individuals' genetic profiles. Where the biobank tissue is used for research, a wider definition is preferred to ensure that ethical and legal protections apply to the samples. Interestingly, there is little accurate data on the extent of biological tissue storage. In 1998, the National Bioethics Advisory Committee estimated that there were more than 282 million specimens stored in the United States and further estimated that the accumulation rate from blood tests, surgery and other medical procedures was probably in the region of 20 million specimens per year.<sup>12</sup>

Secondly, biobanks pose significant and obvious privacy issues, at the individual and family levels. The German National Ethics Council and the French National Consultative Ethics Committee for Health and Life Sciences produced a joint Declaration recognising the risk of data/samples being used for "purposes other than those for which the donor has consented or to be passed on to third parties".<sup>13</sup> Similarly, during the extensive public consultations undertaken by the Australian Law Reform

8 E Eiseman, et al. Case Studies of Existing Human Tissue Repositories: „Best Practices” for a Biospecimen Resource for the Genomic and Proteomic Era prepared for the National Cancer Institute National Dialogue on Cancer (Arlington VA: Rand Science and Technology).

9 <http://www.abrn.net/>.

10 For a discussion of terminology, see R Tutton and O Corrigan, Genetic Data Bases: Socio-Ethical Issues in the Collection and Use of DNA Routledge 2004 at 2-4.

11 See generally, B Knoppers, C Laberge and M Hirtle, Human DNA: Law and Policy International and Comparative Perspectives Kluwer Law International The Hague, 1997.

12 National Bioethics Advisory Commission Research Involving Human Biological Materials: Ethical Issues and Policy Guidance Vol I Maryland 1999 at 13-15. Each of these samples could be further divided onto slides, paraffin blocks, frozen or formalin-fixed or extracted DNA. In addition, any DNA test results would form another data set. See comments in B Knoppers "DNA banking: A retrospective-prospective" in Burley J and Harris J A Companion to Genetics Blackwell Publishing 2002, 379-386.

13 The European Group on Ethics (EGE) in Science and New Technologies to the European Commission Ethically Speaking Newsletter, Issue 5, August 2005 at 27.

Commission in its enquiry on the protection of human genetic information,<sup>14</sup> concerns were expressed about the security of databases from hacking and improper use. There are risks that biobank data could leak to health care providers, interested in direct marketing. This raises a related issue of the current „gatekeeper” role of the medical practitioner. Genetic testing and advice currently flows through doctors. This would be avoided where a company providing direct advice, diagnosis or treatment regimes, based on an analysis of a genetic profile. The Australian Law reform Commission Report recommended against the growth of do-it-yourself internet advertised genetic and parentage testing.<sup>15</sup> Privacy must be protected not only by secure technology systems but also by ethical approval processes that must require that „... provisions to protect the privacy of subjects and to maintain the confidentiality of data”<sup>16</sup> be in place.

Thirdly, there is an issue of the identifiability of the collected tissue samples. This is closely related to the privacy issue in the sense that the relative privacy risk involved in dealings with biobank samples/data depends on the identifiability of the data. Where research does not identify or link the participants to identifiers, ethical approval is often exempted.<sup>17</sup> However, biobank samples will not be anonymous. The data or tissue will generally require data linkage to identifying personal identification, principally to enable recontact for future research projects. The UNESCO International Declaration on Human Genetic Data (2003) adopts the accepted distinctions between ”(ix) Data linked to an identifiable person: Data that contain information, such as name, birth date and address, by which the person from whom the data were derived can be identified; (x) Data unlinked to an identifiable person: Data that are not linked to an identifiable person, through the replacement of, or separation from, all identifying information about that person by use of a code; (xi) Data irretrievably unlinked to an identifiable person: Data that cannot be linked to an identifiable person, through destruction of the link to any identifying information about the person who provided the sample”<sup>18</sup>. While epidemiological research may be able to be conducted on anonymised data, other research may require follow-up with contact with the sample donor. Biobanks must develop explicit policies about coding and data linking to sample donors.

Fourthly, biobanks are being established with the express aim of conducting long-term research

where human tissue collected and the data derived will be stored and used for future research. This aspect makes the issue of research consent especially important. Biobank guidelines generally address the consent issue and emphasise the need for explicit information to be given to those depositing tissue. The consent process must ensure that proper informed and voluntary consent is obtained not only for any approved research projects but also for the use of the tissue/data for research in the future.

Finally, biobanking is expanding in a context in which the biotechnology strategies of most developed countries aim to increase private sector investment in research.<sup>19</sup> So, the German National Ethics Council Opinion on Biobanks for research recognised that biobanks may arouse „anxiety and distrust”.<sup>20</sup> Similarly, the Australian Law Reform Commission public consultation process uncovered public scepticism about the continuing „heavy degree of commercialisation of [medical and genetic] research” and that people did not want their „altruism to lead to billion dollar profits for multinational pharmaceutical companies”<sup>21</sup> Recognising that commercialisation challenges public trust in

14 Australian Law Reform Commission/ Essentially Yours: The Protection of Human Genetic Information in Australia Report 96 2003 Recs 15-1 to 15.3.

15 Ibid Recs 11-1, 11-5 and 11-6; 35-1 and 35-2.

16 This is the USA Common Rule formulation Department of Health and Human Services Policy for the Protection of Human research Subjects 45 CFR 46.101(a)(7).

17 Ibid CFR 46.101(b)(4).

18 See above note 12 NBAC Unidentified samples: Sometimes termed „anonymous”, unidentified human biological specimens. Unlinked samples: Sometimes termed „anonymised”, lack identifiers or codes that can link a sample to an identified human being; Coded samples: Sometimes termed „linked” or „identifiable”, from identified specimens with a code rather than personally identifying information; Identified samples with a personal identifier (such as a name or patient number) to link the biological information directly to the individual from whom the material was obtained. (pp 16-17.

19 See B Salter and M Jones, in *Regulating Human Genetics: A Changing of Politics, Biotechnology, Covenants in the European Union Human Genetics Project ESRC Innovative Health Technologies Program UK 2002*; UK Parliament, House of Lords Select Committee on Science and Technology, *Science and Society 3rd Report 2000*.

20 Above note 13 at 27.

21 Cited in D Weisbrot ‘Public Conspiracy, Genetic Counselling and the Required Legal Infrastructure’, Symposium on Taiwan’s Private Project, unpublished paper ALRC Sydney, 8 August 2005 at p19.

science,<sup>22</sup> a policy of transparency by biobanks in relation to their commercial activities is advisable. Public trust is an essential pre-condition for the successful operation and future research benefit of biobanks.

### Regulation of Biobanks

The regulation of biobanking has, or is being considered in a number of countries and by a range of research or regulatory organisations<sup>23</sup>. For example, the German National Ethics Council and the French National Consultative Ethics Committee for Health and Life Sciences have produced a joint Declaration of the need for a new regulatory framework to ensure the development of research balanced against the protection of the individual.<sup>24</sup> The Australian Law Reform Commission (ALRC) published *Essentially Yours: The Protection Of Human Genetic Information*, which recommended changes to the regulation of databases and genetic research in general.<sup>25</sup> Essentially, there is a choice between the privacy law and guidelines approach or an approach based on specific human tissue legislation.

Internationally, the regulation of biobanks relies on a mix of hard and soft law. The „hard” law is generally in the form of privacy legislation. For example, in Australia the Privacy Act 1988<sup>26</sup>, which was originally directed towards government record keepers and credit providers, now has a major influence in the regulation of research generally and biobanks, in particular.<sup>27</sup> The Privacy Act was amended<sup>28</sup> to extend to private sector agencies and applies a range of Principle –requiring Collection of data only for its functions; Use and disclosure for primary purpose (consent; direct marketing; health); Data quality; Data security-reasonable steps; Openness; Access and correction; Identifiers’ use and non-disclosure; Anonymity; Trans-border data flows; and, sensitive information-exceptions These principles are not dissimilar to other jurisdictions. The legislation is described as „light-touch” avoiding a strict enforcement regime in favour of the introduction of specific industry codes developed by the industries themselves and approved by the federal privacy Commissioner. This last principle is important as „sensitive information” covers health information in general. Hard law extends to anti-discrimination laws. In Australia, for example there is federal legislation including Sex Discrimination Act 1994, Racial Discrimination Act 1975, Disability Discrimination Act 1992, Age Discrimination Act 2004 and the Workplace Relations Act.

The „soft” law takes the form of research guidelines. Internationally, the Declaration of Helsinki (1965) is the foundation for the common framework for the regulation of human experimentation. The Declaration established the key pillars for ethical review of medical research (voluntary consent of the research participant; independent review of the project; assessment of the risk; involvement of competent researchers of integrity and research merit). A three-tier system of ethics review generally applies with the researcher designing the project

22 D Chalmers and D Nicol (2004) “Commercialisation of Biotechnology: Public Trust and Research”, 6 *Int.J.Biotechnology* 116. See also above at note 19.

23 Council of Europe, Steering Committee on Bioethics, Draft Recommendations on research on biological materials of human origin, Strasbourg, 28 November 2005; Opinion of the European Group on Ethics in Science and New Technologies to the European Commission, Ethical Aspects of Human Tissue Banking, 21 July 1998; Swedish Medical Research Council (MFR), Research ethics guidelines for using biobanks, especially projects involving genome research, June 1999; Report of the Bioethics Advisory Committee of the Israel Academy of Sciences and Humanities, Population-Based Large-Scale Collections of DNA Samples and Databases of Genetic Information, December 2002; ESRC Research Ethics Framework, Discussion Paper 2: The international dimension to research ethics: the significance of international and other non-UK frameworks for UK social science, April 2004; Department of Health & Human Services, Public Health Service, National Institutes of Health, National Cancer Institute, 133rd National Cancer Advisory Board, Summary of Meeting, February 16-17 2005; ESRC Economic & Social Research Council, Research Ethics Framework (REF), Discussion Paper 2, April, 2004; Working Group on DNA and Epidemiology (TUKIJA) of the National Advisory Board on Health Care Ethics (ETENE), DNA Samples in Epidemiological Research, 26 August 2002; *Dr Beata Scholtz*, Debrecen Clinical Genomics Center, Biobanks and Scientific Research; German National Ethics Council, Biobanks for Research, 2004.

24 Above note 13 at 27.

25 Above note 14. *Dr Francis Collins* described the Report as „a truly phenomenal job, placing Australia ahead of what the rest of the world is doing, described this Report” Head, US National Human Genome Research Institute and Chair, Human Genome Project and International Haplotype Mapping Project News release during the XIX International Congress of Genetics Melbourne July 5-9 2003.

26 [www.privacy.gov.au/act/index.html](http://www.privacy.gov.au/act/index.html) See also Victoria: Information Privacy Act 2000 ; Health Records Act 2000 ; NSW: Privacy and Personal Information Protection Act 1998; Health Records Information Privacy Act 2002 ACT: Health Records(Privacy and Access Act 1997).

27 See Privacy (Private Sector) Amendment Act 2001 (Cth).

28 Privacy (Private Sector Amendment) Act 2000 (Cth).

ethically, for review by an independent research ethics review committee reporting to a national bioethics committee. The research guidelines are contained in some form of national code of ethical conduct in research. In Australia, the National Statement on Ethical Conduct in Research Involving Humans<sup>29</sup> sets down a comprehensive national ethical regulatory framework for human research. However, the Australian experience exemplifies trends in other countries towards greater regulation of human research and away from earlier „soft” self-regulation.<sup>30</sup> For example, the ALRC Report recommended that the NRMRC in its reconsideration of the National Statement should provide ethical guidance on the establishment, governance and operation of human genetic research databases, including the registration of these databases on the public register. The recommendation on registration is important. This would enable the NHMRC not only to track the genetic research undertaken in Australia but also ensure greater transparency and accountability for the current biobanks operating in this country. Registration would require institutions to comply strictly with national standards and would provide an effective and inexpensive audit trail in annual reports to the NHMRC<sup>31</sup>.

Interestingly, the ALRC Report recommended the harmonisation of all health privacy legislation applying to genetics.<sup>32</sup> The most interesting and unique recommendation proposes that genetic samples should be included in the general definition of „Personal Information” under Privacy Act 1988. This recommendation recognises that tissue samples subjected to genetic analysis provide information on that person. By treating the results of a genetic test carried out on a bodily sample as information attracts the existing protections, regulatory regime and enforcement procedures of the Act.<sup>33</sup>

### Established and emerging ethical principles for Biobanks

There have been calls for international harmonisation of legislative regulation<sup>34</sup> across jurisdictions. This has been prompted by the understanding that biobank collaboration and will expand to enhance the power of the research data and results that can be generated through these linkages. Harmonisation of legislation is inevitably complex, however, harmonisation of human research ethical principles is more realistic. There is already considerable harmonisation between the codes of research guidelines of most nations. Of course, the opera-

tion of these codes often uncovers significant divergences in practice. Based on international standards for ethical conduct in human research, various international reports<sup>35</sup> and the UK Biobank’s Ethics and Governance Council Framework, the following set of accepted and established principles and emerging ethical principles are proposed. Principles 1-10 are generally accepted standards for human research: Principles 11-20 are emerging or required standards for human research that are more specific to the aims and proposed work of biobanks

#### *Ethics Review and Proper Research Governance*

Biobanks have the twin goals of facilitation of genomic research balanced with the protection of the welfare of the biobank sample contributors<sup>36</sup>. Most importantly, the governing institution will be required to operate the biobank with due regard to the protection of the interest of the research participants. In this respect, biobanks should be involved in the development and promotion of the highest standards of ethical conduct in research. An institution establishing a biobank should establish gov-

29 National Statement on Ethical Conduct in Research Involving Humans Prepared by the Australian Health Ethics Committee under the relevant provisions of the National Health and Medical Research Council Act, 1992 (Cth) and endorsed by the Australian Vice Chancellors’ Committee, the Australian Research Council and the Learned Academies in 1999. It is a national research code of practice governing social as well as biomedical research.

30 D Chalmers “Research Involving Humans: A Time for Change?” (2004) 32 J of Law, Medicine & Ethics (4) 583-595.

31 Above note 14 Recs 18-1 to 18-3.

32 Ibid Rec 7-1.

33 Ibid Rec 8-1.

34 B Knoppers, ‘Biobanking: International Norms’ (2005) 33 The Journal of Law, Medicine & Ethics 7; J Kaye “Do we need a uniform regulatory system for biobanks across Europe?” (2006) 14 European J of Human Genetics 245-248.

35 Above note 23 and also UK Biobank, Ethics and Governance Framework, Background Documents 10 October 2003

36 See National Bioethics Advisory Commission Report Research Involving Human Biological Materials: Ethical Issues and Policy Guidance Vols 1& II Bathesda, Maryland August 1999 <http://www.georgetown.edu/research/nrcbl/nbac/pubs.html>. See also National Bioethics Advisory Commission Report Ethical and Policy issues in Research Involving Human Participants Vols 1& II Bathesda, Maryland August 2001 at <http://www.georgetown.edu/research/nrcbl/nbac/human/overvol2.html>.

ernance structures appropriate for and consistent with the primary research focus<sup>37</sup>, including a separate independent ethics review committee to scrutinise and assess the ethical acceptability of the project. The governance standards will cover confidentiality and privacy and the management and administration processes of the biobank with transparency and accountability.

#### *Scientific Merit*

Biobanks should be involved solely in research with demonstrable scientific merit. A biobank will follow accepted research governance principles with independent scientific review of the merit of the research project.

#### *Integrity of Researcher*

International (see CIOMS International Ethical Guidelines for Biomedical Research Involving Human Subjects, 2002) and national research standards emphasise the need for integrity in research. The integrity of a researcher is fundamental to the ethical conduct of biobank or other research.

#### *Avoiding Conflicts of Interest*

Disclosure of any conflict of interest should apply to biobanks, especially when dealing with commercial organisations or developments. The general principle of disclosure of interest is recognised in national codes for the responsible conduct of research<sup>38</sup>. There are also well-established principles in science and medical research journals requiring declarations of financial associations with commercial organisations.

#### *Recruitment and Non-discrimination*

The principle of non-discrimination applies to biobanks and their operations. In the case of recruitment, this principle requires that a selection process be established that reflects inclusion of a wide variety of participants from minority groups and reflecting socially diverse cultural and functionally incapacitated groups<sup>39</sup>

#### *Consent, including consent to future projects*

Recruitment into a biobank should ensure the voluntariness of consent and participation in conformity with accepted research ethics principles. The information provided to participants must be carefully reviewed to ensure the integrity of the consent process and that the collection, use, storage and release of information is consistent with the actual consent given. Human tissue collected for one purpose and the data derived can be stored and used for future undefined research.

Biobanks will conduct long-term research. This will involve increases in the recruitment of new participants and invitations to participants to provide new information. Re-contacting participants („re-consent” or „future/ follow-up consent”) may arise in circumstances such as:

- To collect new/update information or samples,
- To seek consent for new uses or research not within the exiting consent

#### *Privacy and Confidentiality*

Privacy and confidentiality must be guaranteed by biobanks that will hold large amounts of genetic samples and information. Many different researchers will access these samples and information, over many years, and for many different research purposes. The governing institution must assume responsibility for maintaining legal and ethical standards of confidentiality and privacy in the overall governance of its biobank.

#### *Anonymisation*

Biobanks should anonymise data as a procedural and practical aspect of the principle of privacy and confidentiality protection. Biobanks should have procedures for anonymisation of data, including systems for re-anonymisation of tissue samples. This does not preclude the possibility of later re-identification of a participant provided consent has been obtained for recontact for future research projects.

#### *Withdrawal from project*

The accepted international ethical research standard requires that participants must be free, at any time to withdraw consent to further involvement in

37 In this respect, there is a fundamental divergence between the commercial company structure and the research governance structure. Under a company structure, the accepted legal standard demands that the company owes its principal duties to the shareholders.

38 See as example, Australian Code for the Responsible Conduct of Research published by the Joint NHMRC/AVCC Second Consultation Draft February 2006. Many Australian organisations now require declarations of commercial interest in the participant information and consent documents.

39 UK Biobank, Ethics and Governance Framework, Background Documents Wellcome Trust and Medical Research Council and Department of Health UK, 10 October 2003 at 5-6. The Council of Europe's 'Convention on Human Rights and Biomedicine' provides an Article 11 that „any form of discrimination against a person on grounds of his or her genetic heritage is prohibited”.

the project. In the case of a biobank, the right to withdraw may occur at different levels,

- complete withdrawal including the destruction of samples and data, or
- non-participation withdrawal allowing retain and use by the biobank of the data/sample but not participating in any other way, or
- non-contact withdrawal allowing retention of data/sample in an anonymised form with withdrawal from any future contact or projects.<sup>40</sup>

Standard protocols for biobanks should include the right to withdraw and specify different levels of withdrawal.

#### *Public Dissemination of Research Results*

As a general accepted ethical principle, the results of research should normally be published and disseminated to contribute to the advancement of public knowledge.<sup>41</sup> Biobanks should commit to this principle and ensure that research is published in the scientific literature or in other ways that allow assessment and scrutiny of the results. As a public resource, all results should normally be released into the public domain and available on a publicly accessible database. This is the policy adopted by the International Haplotype Mapping Project<sup>42</sup> and GenBank.<sup>43</sup>

#### *Public Transparency*

As public resources, the research governance arrangements for biobanks should include public transparency procedures that allow public scrutiny and encourage public trust. Annual reports should be published and opportunities for public input enabled when establishing ethical guidelines or changing procedures. For example, in Australia there is a statutory requirement, under the National Health and Medical Research Council Act, 1992, for two stages of public consultation before the publication of ethical guidelines for medical research. Also, extensive public consultation was undertaken by the Australian Law Reform Commission in its enquiry into the protection of human genetic information that resulted in the report entitled *Essentially Yours*<sup>44</sup>.

#### *Independent Control of Data and Samples*

As a general principle, control of the biobank data should be under the control of a body or individual independent from the researchers seeking access to the data or samples. Biobank governance should include the appointment of an independent intermediary between the researcher and the data or samples. The principle of independent control is

specific to the emergence of biobanks. The important underlying idea of an independent intermediary is the introduction of a check and balance in the governance structure for the data and samples on the biobank. This principle represents a change for researchers and certainly for some groups such as hospital-based pathologists. The Australian Law Reform Commission<sup>45</sup> recommended that best practice in genetic research involving genetic databases require the appointment of an independent intermediary between the researcher and the data and samples (a gene trustee) to protect the privacy of samples and information. This idea of trusteeship has been described by the Ethics and Governance Council of the UK Biobank as acting „as the steward (emphasis added) of the resource, maintaining and building it for the public good in accordance with its purpose”.<sup>46</sup> There has also been suggestion that biobanks could be set up under the framework of a public charitable trust.<sup>47</sup>

#### *Waivers of Consent*

Researchers may request research ethics committees to waive consent in cases where the public interest in the value of the research outweighs (emphasis added) the requirements of personal privacy. In such cases, research ethics committees may waive consent after carefully considering a

<sup>40</sup> Ibid at 10.

<sup>41</sup> Above note 22. Australia, National Statement on Ethical Conduct in Research Involving Humans, Ch 1.18 “The Results of Research... should normally be published in ways which permit scrutiny and contribute to public knowledge.”

<sup>42</sup> The successor to the Human Genome Project, see <http://www.hapmap.org/> Each access is subject to a “clickwrap” licence to protect the data from spurious patent claims.

<sup>43</sup> The Human Genome Project’s public domain sequence data site at <http://www.ncbi.nlm.nih.gov/Genbank/>

<sup>44</sup> Above note 21. Similarly, in GMO licensing compulsory consultation at the application and assessment stages are required, Gene Technology Act, 2000 S 52).

<sup>45</sup> Above note 14, Rec 16-1.

<sup>46</sup> Above note 39 at 12. See also the „custodian” proposal by the Ireland Law Reform Commission *The Establishment of a DNA Database Report* 78-2005 at Chapter 4.

<sup>47</sup> *D Winickoff and R Winickoff* „The Charitable Trust as a Model for Genomic Biobanks’ (2000) 349 N Eng J Med 12 at 1180-1184. See comment in A Boggio „Charitable Trusts and Human Research Genetic Databases” (2005) 1 Genomics Society and Policy 41-49.

number of matters<sup>48</sup>. Waiver of consent is not uncommon in epidemiological research. Recognising the potential for complaints, public criticism and loss of public trust through inappropriate uses of samples, the Australian Law Reform Commission recommended that ethics committees should provide annual and detailed reports on any research project involving a waiver of individual consent.<sup>49</sup>

#### *Tracking Data Access and Exchange*

All access to and release of information from biobanks should be strictly recorded. Accordingly, proper records of access to and release of information should accompany access and release. There should be a guaranteed, continuous „chain of responsibility”<sup>50</sup> for all access and release dealings in relation to the storage, handling and use of body material and personal data. Access to and release of information from biobanks will occur on a regular basis. Biobanks should develop relations and exchange agreements with partner institutions to enable large-scale research and comparative work on datasets. Collaborating biobanks should have reciprocal access and release agreements, licences or materials transfer agreements (MTAs) in place and recorded.

#### *Health Related Information*

As a general ethical standard, participants should be provided with information about the results of the research.<sup>51</sup> Biobanks have the potential to reveal medically relevant information about the health or future health of participants and possibly, participant’s offspring or relations.<sup>52</sup> Biobanks should have a policy on whether such information or results should or should not be disclosed to the participant. Consent processes should clearly communicate in writing to the participant at the recruitment stage whether health relevant information will or will not be, disclosed to the participant, participant’s off-spring or relations.<sup>53</sup>

#### *Administration for Benevolent Purposes*

Biobanks should be used for, and should promote the principle of the benevolence in research,<sup>54</sup> A consistent with number of statements are appearing declaring that research should not be directed to bio-terrorist or other malevolent purposes<sup>55</sup>. It is difficult to imagine research projects not involving biobanks in benevolent research. However, acceptance of this principle means that data, except under legal process, should not be released to security agencies or police forces.

#### *Benefit Sharing*

The principle of benefit sharing should be adopted in the establishment and research work of a biobank. UNESCO<sup>56</sup>, the Human Genome Organisation<sup>57</sup> and other guidelines<sup>58</sup> have noted the emerging principle of benefit-sharing in general and, in particular, the equitable distribution of benefits from research. UNESCO’s International

48 See, for example, the Australian National Statement on Ethical Conduct in Research Involving Humans, Principle 16.12-16.14 In these cases the research ethics committee must take account of the nature of existing consents, the justification presented by the researcher for the waiver, proposals for privacy and the relationship of the project to an existing project.

49 Above note 14 Rec 15-1.

50 The German National Ethics Council and the French National Consultative Ethics Committee for Health and Life Sciences a joint Declaration The European Group on Ethics (EGE) in Science and New Technologies to the European Commission Ethically Speaking Newsletter, Issue 5, August 2005 at 27.

51 See for example, in Australia, National Statement on Ethical Conduct in Research Involving Humans, Ch 1.18 “Normally, research results should be made available to research participants”. However, with large-scale biobanks, such as the proposed 500,000 volunteers on the UK Biobank, such participant consent may become difficult and impractical. Some biobanks, and the UK Biobank is an example, of chosen, that they will not provide “participants with information, genetic or otherwise, derived from examination of the database or samples by research undertaken after enrolment”. See UK Biobank Ethics and Governance Framework above note 39 at 8. However, the initial laboratory analysis results will be provided to participants at the physical assessment preliminary stage.

52 See for example, the discussion of genetic research rather than biobanking in the Australian Guidelines National Statement on Ethical Conduct in Research Involving Humans 1999, Chapter 16, particularly 16.10.

53 C Johnston and J Kaye “Does the UK Biobank have a Legal Obligation to Feedback Individual Findings to Participants?” (2004) 12 Medical Law Review 239-267 argue that, in the case of the UK and other EU countries, there may in fact, be not only an ethical duty to disclose but also a legal duty by Article 2 of the European Convention on Human Rights.

54 See Privacy Act 1998 (Cth).

55 USA, Council on Ethical and Judicial Affairs, Guidelines to Prevent Malevolent Use of Biomedical Research 2004; United States of America Committee on Research Standards and Practices to prevent the destructive application of Biotechnology; National Research Council Biotechnology Research in an Age of Terrorism, 2004.

56 UNESCO Universal Declaration of Bioethics and Human Rights 2005.

57 HUGO Statement on Benefit Sharing 2000.

58 E.g. see Convention on Biological Diversity.

Declaration on Human Genetic Data is one of the most emphatic assertions of the principle and states that “benefits... from the use of human genetic data ... should be shared with the society as a whole and the international community.” However, the principle is amorphous, particularly in relation to the operation of intellectual property protections and licensing<sup>59</sup>. Nevertheless, the principle encourages researchers and research organisations to consider ways in which the benefits of the biobank research may be equitably distributed. It has been argued<sup>60</sup> that the rhetoric of this principle should be replaced with the implementation of appropriate and practical mechanisms for benefit sharing. It has been suggested that the general advantages derived from public health research and the specific development of new health care profits represent such benefits.<sup>61</sup>

#### *Closure and Termination of Biobank*

As a general principle, biobanks should have policies and guidelines dealing with the possibility of transfer, closure of assets and these should be communicated to the participants at the time of recruitment.<sup>62</sup> Similarly, any variation in the arrangement for the maintenance or storage or stewardship of the data for samples should be communicated during the currency of the biobank.

#### *International harmonisation of Guidelines and advisory statements*

Biobanks will require independent scientific and ethical scrutiny, review and approval for studies, many of which may be handled transnationally. Where biobanks operate transnationally policies and guidelines should be in place for conducting such transnational research.<sup>63</sup> The ever-expanding library of international declarations, statements, guidelines and conventions has a key role in the development of international collaboration and linkage between biobanks. The linkage trend requires international harmonisation of guidelines across jurisdictions. As examples, the CIOMS International Ethical Guidelines for Biomedical Research Involving Human Subjects, 2002 establish standards for human research. So too, the UNESCO International Declaration on Human Genetic Data (2003) requires „the respect of human dignity and protection of human rights and fundamental freedoms in the collection, processing, use and storage of human genetic data, human proteomic data and of... “biological samples”, in keeping with the requirements of equality, justice and solidarity” (Art 1a); and “shall be consistent with the international law of human rights” (1b); „except in the

investigation, detection and prosecution of criminal offences and in parentage testing that are subject to domestic law that is consistent with the international law of human rights” (1c).<sup>64</sup>

#### *Transnational Recognition of Research Ethics Approvals*

Where biobanks are involved in transnational research projects, ethical review and approval will be required from all participating institutions. Collaborating biobanks must have in place proper ethical governance arrangements. Compliant biobanks should not collaborate with biobanks that do not have the required ethics approvals and monitoring systems or otherwise do not comply with international best practice standards. Participating biobank must operate with due regard to the protection of the interest of the research participants.

The national codes for ethical research in many countries now recognise a system of centralised

59 R Chadwick and K Berg, ‘Solidarity and Equity: New Ethical Frameworks for Genetic Databases’ (2001) 2 *Nature Reviews Genetics* 318; K Simm, ‘Benefit-sharing: an Inquiry regarding the Meaning and Limits of the Concept in Human Genetic Research’ (2005) 1 *Genomics, Society and Policy* 29; B Knoppers, ‘Biobanking: International Norms’ (2005) 33 *The Journal of Law, Medicine & Ethics* 7; D Nicol Above note 6 at 89-103.

60 B Knoppers and L Sheremeta “Beyond the Rhetoric: Population Genetics and Benefit-sharing” (2003) 11 *Health L J* 89.

61 Above note 6.

62 Any variation in the arrangement for the maintenance or storage or stewardship of the data for samples should be communicated during the currency of the biobank. Note the Nolan Principles of Public Life covering responsibility, merit, independent scrutiny, equal opportunities, poverty, openness and transparency and proportionality. Office of Science and Technology, see [www.ost.gov.uk/policy/advice/cop-sac/annex.htm](http://www.ost.gov.uk/policy/advice/cop-sac/annex.htm).

63 D Chalmers, “International Medical Research Regulation; from ethics to Law” in S McLean *First Do No Harm*, Ashgate Press 2006 at 81-100.

64 Similarly, the HUGO Ethics Committee Statement on Human Genomic Databases in December 2002 declares that human genomic databases are a public resource (1(b)) and all should have access to the benefits of such databases (1(c)) declared that individuals should have choice with regard to donation storage and use of the sample and information derived from it. The participants were also to be informed of a degree of indentifiability and the possibility of information from the database might be shared with other researchers in other countries or commercial entities.

ethical review for multicentre research. Under these arrangements, guidelines usually allow the acceptance of a central ethical assessment or adoption of the decision of another research review committee. This avoids duplication and enables common monitoring and reporting responsibilities to be undertaken. Centralised ethical review applies within countries rather than internationally. However, with the growth of multicentre international research generally and plans to conduct collaborative biobank research in particular, it may be desirable to develop a formal procedure to allow biobank institutions to agree before the start of a research project to a single ethical and scientific assessment process by the lead biobank, subject to the approval of the other participating biobanks.

## Conclusion

Biobanks promise to significantly increase the quantity of genomic research as well as to hopefully increase the quality of research results. The regulatory arrangements for biobanks should aim, therefore for the twin goals of research facilitation alongside assurances of participant protection. Public trust will be an imperative for biobanks. Public trust is a fundamental cornerstone in the cultivation and maintenance of trust in genetic science and biobanking. Biotechnology Australia, a government organisation established to promote its national biotechnology strategy, regularly tracks and samples public opinion on GMOs, stem cells

and public attitudes to and trust in, genetic research. All of the sampling indicates, consistent with other national sampling that there is a very high degree of public acceptance of genetic research provided the research is aimed at addressing diseases and developing therapeutics.<sup>65</sup> However, trust can be easily dissipated and lost. Research is no longer a self-regulating activity. The Australian Report „Essentially Yours”<sup>66</sup> in recommending increased surveillance and regulation of biobanks, is in line with approaches towards the direction of stricter regulation<sup>67</sup>. Harmonisation of human research ethical principles is a realistic starting point as there is much common ground about accepted and established principles, as well as emerging ethical principles for biobanks. But, a necessary component of harmonization is a clear commitment to fundamental right of participants in relation to consent, privacy and non-discrimination. Biobanks must commit to their duties of good governance, probity, transparency and security. Appropriate and effective regulation is a prerequisite to the development of the research potential-

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65 Above note 22.

66 Above note 14.

67 Above note 30 strict statutory licensing schemes for GMOs (Gene Technology Act 2000(Cth) and embryo and stem cell research, Research Involving Human Embryos Act 2002(Cth).