PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

A REPORT BY
THE BIOETHICS ADVISORY COMMITTEE

SINGAPORE

May 2007

FOREWORD

Singapore has made much progress in developing talent and infrastructure in biomedical sciences over the past five years. As the biomedical sciences initiative enters the next phase, new initiatives have been planned for strengthening capabilities in clinical and translational research. Such research critically depends on the use of personal information. If continuing success is to be maintained, public confidence in physicians and biomedical researchers is essential. Thus, a comprehensive statutory framework is necessary for the protection and use of personal information in research. This report considers the ethical principles for data protection and makes recommendations for the establishment of such a framework.

Much research into existing regulatory standards, policies and practice guidelines of international and national ethics and professional bodies was carried out in producing the recommendations in this report. The recommendations were finalised after careful consideration of the views and comments from international and local experts as well as those from healthcare, research and governmental institutions, and professional and religious organisations. The BAC is much indebted to the various parties and individuals for their contribution.

It is hoped that these recommendations, which balance the need to ensure privacy and confidentiality and the need to facilitate research with legitimate public interest, will help to align Singapore with international best practices.

I would like to thank my fellow committee members and members of the Human Genetics Subcommittee, which was chaired by Associate Professor Terry Kaan, for their commitment and dedication to the project. They have endeavored to ensure that the recommendations are a considered, balanced and fair response to difficult and sensitive issues pertaining to the use of personal information in biomedical research.

Professor Lim Pin
Chairman
Bioethics Advisory Committee
May 2007

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PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

EXECUTIVE SUMMARY

Introduction

1. Biomedical research is critical to advances in medical science and technology and leads to improvement in the health of the public. This Report discusses the need to use personal information in biomedical research and makes recommendations aimed at establishing principles for data protection and confidentiality consistent with legitimate research needs.

2. We identify five issues for discussion:

   (a) What is personal information?

   (b) Do we require a legal framework for the protection of privacy and confidentiality?

   (c) Issues of privacy and confidentiality;

   (d) Issues of informed consent; and

   (e) Issues of access by third parties such as employers or insurance companies.

Personal Information

3. This Report considers personal information to be any information about an individual. For example, a blood sample may yield information about a person's blood group and this information is personal information. Personal information may be categorised into identified personal information and de-identified personal information. In the latter, the identifying particulars are separated from the rest of the information. The separation can be reversible or irreversible.

4. Only if proper steps are taken to protect the identity of research participants may their personal information be used for research purposes without breach of privacy. For this reason, de-identified personal information is used where possible in research. There are various ways in which a greater or lesser degree of security can be obtained using de-identification procedures. In general, the more sensitive the information, the more care is needed to ensure that the identities of the individuals concerned are protected and their personal information kept secure.

5. Sometimes the personal information needed for research is information provided to a physician for the diagnosis or treatment of a patient. Such medical information is kept in medical records. Sometimes the information needed is obtained from volunteers who are not patients. Sometimes the information is genetic information, which may or may not be medical information.

The Legal Protection of Personal Information

6. The Report considers whether or not some legal framework is needed, and concludes that it is. A legal framework that protects privacy while allowing the legitimate use and exchange of information may be valuable in its own right, and may be essential if researchers in Singapore are to collaborate with researchers in other jurisdictions.

7. Singapore's existing laws provide for data protection and confidentiality in specific circumstances, such as between banks and their customers, and between solicitors and clients, but there is no comprehensive statutory framework for the protection of personal information. A legal regime for personal information protection could provide a general framework for public engagement and for policy development.

8. A data protection law could also assist the development of realistic expectations on the part of researchers and prospective research participants regarding the use of personal information in biomedical research. In addition, the management of de-identified information, the right of access to research data by participants, and the use of information for epidemiological and public health research, are all matters where particular provisions may be helpful.

Privacy and Confidentiality

9. Personal information should be stored and managed in ways that provide proper security and confidentiality. While a researcher collecting data from consenting individuals will know their identities, such information should be stored and managed as de-identified information as far and as early as possible.

10. Researchers are expected not only to take proper security safeguards with data, but to refrain from attempting to identify an individual from de-identified information. Moreover, research data should not be made available to insurance companies or employers, because it is not obtained for health or employment purposes and can be misleading if used outside the research context.

11. Irreversibly de-identifying personal information will severely limit the research value of the information and disable certain types of research, such as those that require further information from records over a period of time. Nevertheless, certain types of personal information may be especially sensitive such that irreversible de-identification is the only means by which the privacy interests of the individuals concerned may be sufficiently protected. Irreversibly de-identified information, however, should not be subject to privacy and confidentiality requirements, provided that proper measures are taken to ensure that the de-identification is really irreversible.

12. When personal information is to be reversibly de-identified, the extent and thoroughness of de-identification should be balanced against the harm that might follow in the event that an individual is identified. It is the responsibility of the research ethics committee or Institutional Review Board (IRB) to consider the extent and means of de-identification proposed.

13. The level of confidentiality safeguards, whether in the extent of de-identification or secure safekeeping of data, should be commensurate with the potential risk of harm to research participants. Generally, the confidentiality obligation of research institutions involved in large-scale research initiatives will be greater than that of research performed by a single researcher.

Informed Consent

14. Voluntary informed consent and confidentiality safeguards are the fundamental means to privacy protection. Generally, the use of personal information in biomedical research requires the consent of the individual concerned and the approval of an IRB.

15. Specific consent is consent for a specific research project or for a specific purpose. General consent is consent that does not limit the use of the information or tissue contributed for a specific project or purpose. When general consent for future research is given, it relieves the researcher of the need to re-contact the individual concerned for a fresh consent.

Consent and Proportionality

16. The process of obtaining consent should be such as to ensure appropriate understanding of what is being consented to. Details of information to be

provided should be in proportion to the sensitivity of the research and risk of harm to the research participants. Consent should be explicit, in writing and include detailed information where the risk of harm is appreciable. Where the risk is low, less information may suffice for the individual to feel able to give consent.

17. We are of the view that specific consent is required for sensitive research or when the research involves identified personal information or tissue samples. General consent should be a sufficient requirement for subsequent unspecified research, subject to de-identification of the information or tissue used as well as IRB review.

Consent and Reciprocity

18. There are many important research uses of medical information that do not contribute directly to the healthcare of individuals, but are beneficial to society. Such research can be granted ethical endorsement under the principle of reciprocity, which encompasses the idea that accepting benefit from past medical research, inherent in the utilisation of medical services, carries some expectation of a willingness to participate in research for the common good.

19. While informed consent should generally be obtained for the research use of medical information, including information derived from tissue samples, the procurement of consent may not be possible or practicable in every situation. Where the research poses minimal risk to individual privacy and confidentiality of information but promotes public good, the consent requirement may be waived, although appropriate privacy and confidentiality safeguards must be ensured. The types of research that typically qualify for such special treatment are epidemiological research and public health research.

20. Information held in disease registries and other national registries is essential to disease prevention, public health planning and policy-making, as well as research aimed at improving public health. We consider it to be ethically proper for medical information to be disclosed by physicians to national disease registries without patients' consent, provided that adequate privacy and other ethical safeguards are in place, and patients are appropriately informed.

21. Medical records may be stored as paper or electronic records, but in either case the ethical principles of consent and confidentiality would apply. Much valuable medical knowledge has resulted from the study of patients' medical records and there is every reason to encourage this established practice, provided patient privacy and the confidentiality of the medical information are safeguarded. We therefore recommend that IRBs be legally empowered to waive the patient consent requirement in situations where the research involves only the use of medical records, with no patient contact. For such research, IRBs should be satisfied that:

(a) the research is justified and poses minimal risk of harm to the patients concerned;

(b) the research would not be possible without the use of medical records;

(c) there are appropriate safeguards to protect patients' privacy and the confidentiality of their information;

(d) obtaining consent is not practicable; and

(e) the researchers are professionally and legally bound through appropriate contractual terms and undertakings to maintain patient privacy and the confidentiality of medical information.

22. Healthcare institutions should develop procedures to inform patients that their medical records may sometimes be used for research and explain the reasons for such research. They should also assure patients that all research will require the approval of an IRB, that there are safeguards to protect their privacy and the confidentiality of their medical information, and they should answer any questions patients may have.

23. Table 1 and Chart 1 on pages 42 and 43 summarise the consent requirements for the use of personal information and tissue in research.

Additional Considerations about Consent

24. Two additional considerations about consent are included in the Report - vulnerability and withdrawal of consent.

25. Vulnerability may be thought to exist if one's ability to give voluntary consent is compromised or if one would be at heightened risk of adverse consequences from the research. Three common categories of vulnerable person are:

(a) children and adolescents;

(b) the mentally impaired; and

(c) persons in dependent relationships.

26. When vulnerable persons are involved in research, they are entitled, as a general rule, to the same considerations of privacy and confidentiality protection as any other research participants, and this principle needs to be kept in mind in the conduct of the research.

27. Participants should be able to withdraw consent to participate in research at any point, and be made aware of the procedure for withdrawal and its implications

when consent is sought. Researchers should assure potential participants that no reason need to be given for withdrawing consent and that such decisions will not compromise the quality of any care or entitlements that might be given to them or their families, where applicable.

Access to Medical Information by Employers and Insurers

28. The Report also discusses third party access to medical information. Medical information should not be disclosed to third parties without the individual's consent, although there are circumstances when an employer or an insurance company may reasonably expect disclosure of medical conditions, with consent.

29. The main ethical difficulties arise when predictive information is involved, e.g. genetic information. Predictive health testing often entails a high level of uncertainty and even for monogenic (single gene) disorders there will often be rather limited predictability of severity and time of onset of the diseases. The key issue is the concealment of immediately relevant information. In the case of employment, the use of valid genetic or other health testing by employers is appropriate to address imminent health and safety concerns, or where the detected or predicted condition is incompatible with the requirements of the job.

30. In the case of insurance, we recognise the potential adverse selection problem that may arise if relevant information is withheld, and that risk evaluation for the purposes of determining insurance coverage inherently involves discriminating between applicants. However, we empathise with the public's concern over possible unreasonable discrimination in the availability of insurance coverage. Nor do we wish to see individuals deterred from obtaining needed information about their medical conditions for fear that they might then be obliged to disclose it.

31. In our view, much of the difficulty arises from uncertainty as to the actuarial value of genetic information, and our preferred solution is a moratorium, as in the UK, whereby predictive genetic test results will not be used by insurers, although certain exceptions apply.

LIST OF RECOMMENDATIONS

The Legal Protection of Personal Information

Recommendation 1: We recommend that the relevant authorities consider establishing a comprehensive statutory framework relating to the use and protection of personal information in biomedical research.

Privacy and Confidentiality

Recommendation 2: Personal information used for research should be de-identified as far and as early as possible and should be stored or transferred as de-identified information.

Recommendation 3: Researchers should take adequate measures to prevent inadvertent identification of individuals. Should an individual be identified inadvertently from de-identified information, the confidentiality and privacy rights of this individual are not abrogated by such identification, and steps should be taken to reinstate and secure them.

Recommendation 4: Irreversibly de-identified personal information need not be subject to privacy and confidentiality requirements.

Recommendation 5: Privacy and confidentiality safeguards should be commensurate with the potential risk of harm from disclosure, and should be proportional to the sensitivity of the information and the kind of research being carried out. When reversibly de-identified information is used for research, IRBs should consider the adequacy of the extent and means of the de-identification in proportion to the risk.

Consent and Proportionality

Recommendation 6: Specific consent should be obtained for sensitive research or when the research involves identified personal information or tissue samples. General consent should be a sufficient requirement for subsequent unspecified research involving the use of de-identified information or de-identified surplus or stored tissues. The information to be provided to the individual when taking consent should depend on and be proportional to the sensitivity of the research and the risk of harm.

Consent and Reciprocity

Recommendation 7: We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to national disease registries by physicians; and establish mechanisms enabling national registries and healthcare institutions to facilitate the use of personal information held or controlled by them for biomedical research that can significantly advance the public good, while safeguarding privacy.

Recommendation 8: We recommend that IRBs be legally empowered to waive the patient consent requirement for research involving only the use of medical records, while ensuring patient privacy and confidentiality of medical information.

Vulnerable Persons

Recommendation 9: We recommend that IRBs, when reviewing research proposals, ensure that any concerns in regard to vulnerable persons are appropriately addressed.

Withdrawal of Consent

Recommendation 10: Research participants should be allowed to withdraw their consent to participate in the research at any time without explanation and without prejudice, and should be informed of the procedure for withdrawal and its implications when consent is sought.

Access to Predictive Genetic Information by Employers and Insurers

Recommendation 11: We recommend that the government consider implementing a moratorium on the use of predictive genetic information for insurance purposes, consider the long-term implications of the accessibility of predictive genetic test results by employers and the insurance industry, and monitor developments in this area.

PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

I. Introduction

1.1 Modern scientific medicine, in its entirety, is a research-based enterprise, and biomedical research has been critical to advances in medical science and public health. Research has improved understanding of the effects of medication, of how environmental and lifestyle factors relate to diseases (such as smoking and cancer, heart and lung diseases) and longevity, and of the effectiveness of preventive and therapeutic practices. Sound research promotes public good and the facilitation of biomedical research is a public interest. Such research critically depends on the use of personal information.[1]

1.2 Personal information may be medical information, genetic information, demographic information, or other information of a private nature. The people from whom it is obtained include patients and volunteers who have agreed to participate in research (i.e. research participants); they may be alive, or deceased. The information may be derived from tissue samples, medical records, researchers' data files, or institutional databases; and these institutions may be of a public or private character. In all cases, the privacy of the persons concerned needs to be protected, since the information is personal and may be sensitive. Consequently, there are rules and conventions regarding the confidentiality and use of research data in general, and medical records in particular.

1.3 Despite these rules and conventions, people may nevertheless be concerned that information about them may be used against their interests, or in ways that they did not approve. These concerns are fed by awareness of the extent to which information can be captured, stored and used by electronic means, and are especially apt in the case of research. Such concerns are not unique to Singapore. They drive privacy and data protection issues in many parts of the world.

1.4 The modern view is that there should be regulation of who may access personal information, and what it can be used for. In the case of research, many scientifically advanced countries have established ethical and legal frameworks to maintain public confidence in and support for the research enterprise.[2] In addition, efforts directed at engaging the public in consultation and education

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1 The term 'personal information' is explained in paragraph 2.1 of this Report.

2 Office for Human Research Protections, US, *International Compilation of Human Subject Research Protections, 2007 Edition*, 2006.

have significantly increased in Australia, Japan, North America and Western Europe.

1.5 This Report considers the need for similar provisions in Singapore, where despite a commitment to developing biomedical research capabilities, the ethical and legal standards for the use of personal information for biomedical research are not always clear. It attempts to strike a balance between ensuring privacy concerns through appropriate safeguards on the one hand and facilitating research of legitimate public interest on the other. We identify five important issues that serve to structure the Report as a whole:

(a) What is personal information?

(b) Do we require a legal framework for the protection of privacy and confidentiality?

(c) Issues of privacy and confidentiality;

(d) Issues of informed consent; and

(e) Issues of access by third parties such as employers or insurance companies.

1.6 In preparing this Report, we have been mindful of the need to distinguish between ethical issues, and the limitations of the current legal or regulatory frameworks arising from recent advances in biomedical science. We have therefore not only made recommendations on ethical issues, but have at several points proposed clarifying the legal framework governing research.

1.7 Many of the ethical issues reviewed in this Report will have relevance to the work of research ethics committees, or Institutional Review Boards (IRBs). It is important that IRBs, whose primary function is to safeguard research participants, feel able to make the best decision, having regard to the needs of the researchers and the value of the research. They must feel able to do this without pressure to adopt the safest and most conservative decision just to avoid legal repercussions, either for themselves or the institutions that appoint them.

1.8 The aim of this Report is to outline applicable ethical principles and best practices in the use of personal information for biomedical research, many of which have already been implemented by IRBs in Singapore. The establishment of a culture in which biomedical research flourishes entails that researchers are clear as to acceptable ethical, legal and social boundaries, as well as the mechanism by which their proposals are reviewed. This explication will also help to assure the public that the procedures which researchers observe are mandatory and enforceable.

1.9 In addition to the consent and privacy concerns discussed in this Report, we note that as a general ethical requirement, research must be conducted in ways that ensure the welfare and safety of individuals. In a multi-cultural and multi-religious society, researchers and healthcare professionals should also be sensitive to the religious and cultural perspectives and traditions of individuals.

1.10 This Report was finalised after careful consideration of the feedback and suggestions received following the issue of a Consultation Paper entitled *The Use of Personal Information in Biomedical Research*, prepared by the Human Genetics Subcommittee of the Bioethics Advisory Committee (BAC). The Consultation Paper, which is reproduced at Annex B, was publicly released on 14 June 2006. Seventy healthcare, research and governmental institutions, and professional and religious organisations were invited to provide comments. A list of these organisations is provided in Annex C. Twenty-five written responses to the Consultation Paper were received and are set out in Annex D. In addition, the BAC held dialogue sessions with members of IRBs and researchers, to better understand their concerns relating to the Consultation Paper. An online discussion forum was set up for public comments on the Consultation Paper, and a public forum was conducted on 15 July 2006. The recommendations also take into account advice, comments and suggestions from local experts and the members of the BAC's International Panel of Experts. Four position papers from local experts are reproduced at Annex A.

II. Personal Information

2.1 Personal information is any information about an individual. It is a very broad term that includes personal particulars, details of medical conditions and healthcare management, physical or psychological measures, dietary requirements and religious or other beliefs. Personal particulars comprise information that identifies a specific individual, such as name, address, date of birth, image (eg. picture, photograph, video), voice recording, National Registration Identification Card (NRIC) number or other means of identification. Personal information may be obtained through written or electronic records, opinions, survey questionnaires, images, interviews, recordings and biochemical or other tests, or from analysis of human tissue.[3]

2.2 In this Report, we consider the use of personal information for the purposes of biomedical research. We are not concerned with the collection, management and use of medical information solely for clinical purposes, since these are already subject to clear ethical and legal requirements.

2.3 When personal information is used in research, it is necessary to ensure the confidentiality of the information and secure the privacy of the person concerned throughout the research process and in any publication resulting from it. Both these aims are usually achieved by de-identification of the information. De-identification refers to the separation of the identifying particulars from the rest of the information. We distinguish identified personal information from de-identified personal information, as follows:

(a) *Identified* personal information: Information where identifying particulars are included, so that the identity of the individual is known, for example, in a medical record;

(b) *De-identified* personal information:

(i) Reversibly de-identified personal information, in which personal identity information has been separated from the information, and a code or system of codes or encryption substituted, so that the identity of the person becomes unknown but could be restored using the codes or reversing the encryption; and

[3] Human tissue is defined as "all kinds of human biological materials derived from living or cadaveric donors, including solid body tissues, organs, foetuses, blood and other body fluids and their derivatives, cord blood, embryos, gametes (sperm and eggs) or any part or derivative thereof." BAC, *Human Tissue Research*, 2002, paragraph 2.1.

(ii) Irreversibly de-identified personal information, which is information that has been permanently stripped of identifying details and cannot be used to identify an individual.[4]

2.4 The extent to which personal information should be de-identified will depend on the sensitivity of the information, which in turn reflects the harm that might arise in the event of disclosure. This will be considered in Part IV, together with the ethical implications and treatment of each of these categories of personal information.

2.5 The most restrictive treatment of personal information should be reserved for the most sensitive information. Some information may not be especially sensitive (like height and weight), but very often, it may be sensitive and should be regarded as private. However, such information should only be considered private if alone or in combination with other information it *identifies* the individual. For example there are unusual situations where an extremely rare condition in a small community might identify an individual even when the individual is not named. In most cases, sensitive personal information relates to living individuals. However, personal information of deceased persons can also be sensitive.

2.6 Medical information is a particular kind of identified personal information. It refers to all information about a patient provided to a physician[5] or derived for the purpose of diagnosis or treatment, and includes the results of medical investigations or tests ordered by the physician. Information so collected is typically recorded, managed and used as medical records, which are governed by ethical and legal requirements, notably those set out by the Singapore Medical Council.[6]

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4 Internationally there is no agreed terminology for the categories of personal information, so explicit definition is important. For discussions of the terminological confusion in this area and the need for harmonisation, see: BS Elger and AL Caplan, "Consent and Anonymization in Research involving Biobanks: Differing Terms and Norms Present Serious Barriers to an International Framework," *European Molecular Biology Organization Reports* 7 (2006): 661-666; and BM Knoppers and M Saginur, "The Babel of Genetic Data Terminology," *Nature Biotechnology* 23 (2005): 925-927.

5 A physician is a person qualified to practice medicine under the Medical Registration Act (Cap. 174), Singapore.

6 Paragraph 4.1.2 of the *Ethical Code and Ethical Guidelines* of the Singapore Medical Council states the general content of clinically relevant information that should be documented as medical records: "All clinical details, investigation results, discussion of treatment options, informed consents and treatment by drugs or procedures should be documented." The same paragraph stipulates that medical records be kept in a manner that is clear, accurate and legible, made during consultation or shortly thereafter, and of "sufficient detail so that any other doctor reading them would be able to take over the management of a case." In addition, paragraph 4.2.3.1 states that a physician is to "respect the principle of medical confidentiality and not disclose without a patient's consent, information obtained in confidence or in the course of attending to the patient."

2.7 Certain personal information, such as genetic information, blood group, or current medication, may or may not be considered medical information, since this depends on whether or not it was provided to a physician for the purpose of treatment or diagnosis. Genetic information broadly refers to any information about the genetic makeup of an individual. It can be derived from genetic testing or from any other source, including a family history of a genetic condition.[7] The term 'personal information' in this Report includes all personal genetic information used in biomedical research.[8] In our Genetic Testing and Genetic Research report, we focussed on issues relating to the derivation of genetic information, and provided recommendations for the ethical derivation, management and use of genetic information. In many respects, considerations in this Report follow from points made in that report.

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7 BAC, *Genetic Testing and Genetic Research*, 2005, paragraph 3.1.

8 The term 'biomedical research' refers to Human Biomedical Research, which includes Direct Human Biomedical Research and Indirect Human Biomedical Research as defined in paragraph 3.7 of the IRB report of the BAC (*Research Involving Human Subjects: Guidelines for IRBs*, 2004). It does not include research in the social sciences or humanities. Direct Human Biomedical Research is "any kind of human biomedical research that involves any direct interference or interaction with the physical body of a human subject, and that involves a concomitant risk of physical injury or harm, however remote or minor" (paragraph 3.7(a) of the IRB Report). Indirect Human Biomedical Research is "any research (not qualifying as Direct Human Biomedical Research) involving human subjects, human tissue, or medical, personal or genetic information relating to both identifiable and anonymous individuals, undertaken with a view to generating data about medical, genetic or biological processes, diseases or conditions in human subjects, or of human physiology or about the safety, efficacy, effect or function of any device, drug, diagnostic, surgical or therapeutic procedure (whether invasive, observational or otherwise) in human subjects whether as one of the objectives or the sole objective, of the research study, trial or activity, and which research, study, trial or activity has the potential to affect the safety, health, welfare, dignity or privacy of the human subjects involved in the study, or of the donors of human tissue or information used in research, or of the family members of any of the human subjects or donors thereof, or to which such medical, personal or genetic information relates" (paragraph 3.7(b) of the IRB Report).

III. The Legal Protection of Personal Information

3.1 The trend in many countries is towards the establishment of a uniform legal framework for the protection of personal information. Much impetus to such a trend arises from unprecedented advances in information technology, allowing the enhanced accessibility and manipulation of electronically stored information. This creates new research opportunities, but poses new risks to the violation of privacy and confidentiality.[9] Scientifically advanced countries have considered it necessary to establish legal regimes for data protection in order to facilitate the exchange of personal information. Their experiences have been instructive and their most relevant provisions for the use of personal information in biomedical research are as follows:

(a) Research use of personal information is regulated within a comprehensive but general personal information protection regime that applies a minimum privacy standard across various ways of using information, including for biomedical research. Personal information that ceases to be identifiable or is unlikely to cause harm to anyone is generally exempted from the requirements of the regime. Such exempted information is typically irreversibly de-identified personal information or aggregate information that cannot identify any particular individual. The extent to which personal information protection regimes should apply to reversibly de-identified information, however, has been a contentious issue. We address this in Part IV of this Report;

(b) Personal information protection regimes generally allow individuals the right of access to their identified personal information held in a databank or registry, to ensure correctness of the information. However, access is not feasible in the case of biomedical research databases held in de-identified form since the researcher is unable to identify an individual;

(c) Data protection provisions usually limit information collection, storage and use to specific purposes, but such provisions may not be applicable in research, since it is not possible to foresee all the research uses of the information. Similarly, while the destruction of information after a suitable period is usually mandated under data protection laws, research data should normally be preserved in case fresh information or theories require further analyses;

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[9] By 'privacy' we mean the quality of being secluded from the presence or view of others, thus, the keeping of one's personal information away from others. By 'confidentiality' we mean the treatment of information that an individual has disclosed in a relationship of trust and with the expectation that it will not without permission be divulged to others in ways inconsistent with the understanding of the original disclosure. In other words, one has some right to privacy, and one has the right to expect that proper safeguards will operate to ensure that private information is treated as confidential by those to whom it is divulged.

(d) Personal information protection regimes generally specify requirements for the transfer of personal information across national boundaries. One such requirement is for an independent body, for example an IRB, to consider if the mode of information transmission ensures effective data protection; and

(e) Many personal information protection regimes explicitly recognise the public interest as including certain kinds of research. Special mechanisms have been established to make available personal information for epidemiological research and public health research. We consider this in greater detail in Part V below.

3.2 The general support of our consultation parties and members of the public for the establishment of a personal information protection regime confirms our view that the majority of respondents expect the Government to ensure that their privacy interests are safeguarded, and that physicians and researchers alike will act responsibly and sensitively in managing their personal information. The establishment of a personal information protection regime carries a two-fold benefit. First, it provides a framework for public engagement and for policy development. We note that policy-makers in Australia, Japan, North America and Western Europe rely heavily on various forms of public consultation for formulating appropriate levels of data protection. Given the nature of the subject matter, this process of public engagement is an ongoing one. Second, it promotes the development of realistic expectations on the part of both researchers and prospective research participants regarding the use of personal information in biomedical research. Even though internationally recognised standards and best practices are available, every jurisdiction that has established a personal information protection regime has had to decide for itself the fundamental concerns it has in relation to personal privacy and the kinds of public interest that can override these concerns. A clear and realistic appreciation of privacy concerns is the foundation of public confidence.

3.3 With the globalisation of research, we anticipate that the collaborative exchange of de-identified personal information will become increasingly necessary. If this occurs, countries with data protection regimes will expect equivalent protection in countries with which such information is exchanged. We are therefore of the view that this is an appropriate time for the relevant authorities in Singapore to consider establishing a comprehensive statutory framework relating to the use and protection of personal information in biomedical research. This framework should include consideration of issues relating to the transfer of personal information to a third party and should provide judicial remedies and sanctions for any breach. We note that in many jurisdictions a public authority or government agency is established to administer data protection regimes.[10]

[10] For instance, privacy commissioners are responsible for ensuring compliance with privacy requirements in Australia and in Canada. In the US, the Office of Civil Rights of the

3.4 While we support the establishment of a personal information protection regime in Singapore, both regulators and the public should understand that the objective of the regime is to facilitate (rather than limit) the appropriate use of personal information, through the provision of proper safeguards. Regulators, IRBs and custodians of information should guard against a disproportionate emphasis on restrictive requirements under the regime, notably the requirement of specific informed consent for the use of personal information, which is a general requirement in such regimes. This occurred in Germany, Canada, the US and the UK,[11] and it severely limited important public health research, necessitating subsequent remedial regulatory action.

3.5 The reputation of Singapore as a centre for responsible biomedical research requires the development of a robust but sensible legal framework for personal information protection, taking into account practical concerns of researchers, and internationally recognised standards and best practices, including data protection mechanisms designed to enable research while maintaining privacy. We note that many of such standards and best practices have already been implemented by IRBs in Singapore.

3.6 Personal information is widely used in biomedical research. As with other leading jurisdictions, we consider the ethical principles of informed consent and confidentiality to be the key principles in such use, because it is these principles that protect the privacy of the individual. Wherever possible, individuals should know how personal information which they have provided in the course of medical care or for research may be used, how their privacy will be protected, and should be given the opportunity to withhold consent if they so wish.

Recommendation 1: We recommend that the relevant authorities consider establishing a comprehensive statutory framework relating to the use and protection of personal information in biomedical research.

Department of Health and Human Services serves to safeguard the privacy of individually identifiable health information.

[11] J Illman, "Cancer Registries: Should Informed Consent be Required?" *Journal of the National Cancer Institute* 94 (2002): 1269-1270; and JR Ingelfinger and JM Drazen, "Registry Research and Medical Privacy," *New England Journal of Medicine* 350 (2004): 1542-1543.

IV. Privacy and Confidentiality

4.1 Personal information that is used in biomedical research is often held in databases, particularly in the form of electronic databases. Most researchers will have a database, in the sense of having a system to store and access the data collected in the research, including any personal information. When a database is large, accessed by many researchers, contains particularly sensitive information, or is to be linked with other databases, ethical considerations of data protection become more pressing.

4.2 It is not our intention to specify particular means by which such databases may be established or managed. Indeed, we recognise the importance of diversity in research databases, and such diversity necessitates different approaches to their creation and operation. However, we suggest that IRBs note and approve data management arrangements, taking into account these guidelines as applicable:

(a) A procedure should be available for research participants to obtain information, make inquiries and withdraw their consent to participate in the research;

(b) Safeguards should be in place to ensure that there is no inappropriate or unauthorised access to information in the database, and to ensure the authenticity of the information;

(c) Depending on the sensitivity of the information or research concerned, a record may need to be kept of who has accessed information in the database and when;

(d) There should be proper limits established to any family contact, and the role of the research participant's attending physician, if any, should also be clearly established, if relevant;

(e) Procedures should be stated for re-contacting research participants or others such as relatives;

(f) Procedures should be stated for obtaining consent related to incompetent research participants;

(g) Research participants should understand, when consenting to participate, the extent and nature of any feedback that they might expect to get on the results of the research as it progresses, and that they can refuse such feedback; and

(h) In the case of deceased persons whose information or tissues may be in a database or tissue bank, access for research should be a matter for the

custodian of the information or tissues, having regard to any explicit objection by the deceased.

4.3 Insurance companies and employers should not have access to personal information in a research database. Research data is not obtained with the aim of providing research participants with specific information about their health status. As such it is of little value to insurance companies and employers, and may be misleading when used outside the research context. In addition, other sensitive information may be derived from research data, such as information about paternity or about the presence of heritable conditions. Researchers have an obligation to protect the privacy of research participants and other third parties such as the close genetic relatives of the participants, and to ensure the confidentiality of all information derived from the research. Issues concerning access to medical information by insurers and employers are further discussed in Part VI.

4.4 When it is necessary for identified personal information to be disclosed due to compulsion by law or other public interest requirements, the research participant should be informed promptly so that he or she may have the opportunity to challenge such compulsion.

4.5 It is the responsibility of researchers to prevent breaches of privacy in respect of personal information in their control or possession. A researcher will normally have access to personal information when it is collected from individuals who have agreed to participate in the research. Even though it is ethically proper for the researcher to hold personal information for purposes covered by the consent, the information should be de-identified as far and as early as possible in the process of information management. In particular, the storage and transfer of personal information should be effected as de-identified information whenever possible. Typically, reversible de-identification should adequately protect the privacy interests of research participants, although the decision to de-identify personal information on a reversible or irreversible basis would greatly depend on balancing the privacy interests of research participants with research requirements.

4.6 Researchers should ensure that personal information is protected by security safeguards appropriate to the sensitivity of the information and the risk of harm, actual or perceived. These safeguards should protect against loss or theft, as well as unauthorised access, disclosure, copying, use and modification. The degree and extent of safeguards should generally be proportionate to the sensitivity of the information held and the potential consequences that may arise from any inadvertent disclosure. Security safeguards should be comprehensive in proportion to the scale of the research when sensitive personal information is involved.

Recommendation 2: Personal information used for research should be de-identified as far and as early as possible and should be stored or transferred as de-identified information.

4.7 Legal scholars and ethicists have indicated that there may be circumstances where de-identification may fail to safeguard the privacy interest of research participants. For instance, de-identification may not sufficiently protect the privacy interest of those affected by diseases that are typically found only in identifiable groups of people, such as Tay-Sachs disease in Ashkenazim populations or sickle cell anaemia in people of African descent. The effectiveness of de-identification may also be limited in small and close knit populations, if extensive information is collected.

4.8 All researchers should respect the privacy of individuals concerned. They should not attempt to identify an individual from de-identified information without proper justification supported by an IRB, as it is a serious breach of ethics to do so. Researchers should also take adequate measures to prevent inadvertent identification of individuals.

4.9 A researcher accessing a de-identified database has no direct contact with and is unaware of the identity of the individuals contributing to the database. In the event that the researcher becomes aware of the identities of these individuals, whether through having access to a code or through other means, the researcher is obliged to treat the information as confidential.

Recommendation 3: Researchers should take adequate measures to prevent inadvertent identification of individuals. Should an individual be identified inadvertently from de-identified information, the confidentiality and privacy rights of this individual are not abrogated by such identification, and steps should be taken to reinstate and secure them.

4.10 Biomedical research that uses personal information (other than information that is irreversibly de-identified), or information that is not already in the public domain, must be approved by an IRB. If a personal information protection regime is established in Singapore (as *per* Recommendation 1), this requirement should be included. However, we have highlighted in our earlier discussion the fact that irreversibly de-identifying personal information would severely limit the research value of the information and further disable certain types of research, such as those that require further information from records over a period of time. Nevertheless, certain types of personal information may be especially sensitive such that irreversible de-identification is the only means by which the privacy interests of the individuals concerned may be protected.

4.11 There appears to be a consensus that irreversibly de-identified information should not fall within the purview of personal information protection regimes in

countries that have such a regime.[12] We agree with this position. Because such information effectively becomes data that is no longer traceable to a particular individual, breach of confidentiality and privacy is no longer possible. Such information may be treated in the same manner as information in the public domain. We recognise that the autonomy of individuals might arguably extend to determining the use of their irreversibly de-identified information, but we are of the view that the principle of reciprocity, which we discuss in Part V, Section B, should apply once de-identification is assured.

Recommendation 4: Irreversibly de-identified personal information need not be subject to privacy and confidentiality requirements.

4.12 For reversibly de-identified information, it is less clear how far such information should still be regarded as within the purview of personal information protection regimes. Leading scientific jurisdictions are still working towards a resolution. One of the key ethical issues is the extent of de-identification that is required before research information is considered to fall outside privacy and confidentiality requirements.

4.13 For some biomedical research, follow-up information concerning the same individual is needed. Hence, reversibly de-identified information is required. Such information should not attract the same legal and ethical obligations that attach to identified information. The extent of de-identification needed is a matter of proportion. The effectiveness of de-identification should be balanced against the level of sensitivity of the information and the harm that might follow in the event that an individual is identified. Since research involving reversibly de-identified information must be subject to IRB approval, it is the responsibility of the IRB to consider the extent and effectiveness of de-identification proposed.

4.14 When identified information is procured, it is the responsibility of researchers to ensure its confidentiality. We have discussed various confidentiality considerations above. These considerations include the storage and transmission of personal information as reversibly de-identified information whenever possible. Accordingly, even if a researcher has obtained the informed consent from a research participant to hold personal information about him or her, it would be prudent for the researcher to store the information in such a manner that the complete personal profile of the research participant is not readily accessible. For instance, the researcher may want to maintain a system of de-identification, through systems of coding or encryption of personal information;

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12 See definitions of 'personal data' in section 1 of the Data Protection Act (1998), UK; and 'human subject' in paragraph 46.102 of the Office for Human Research Protections, *Federal Policy for the Protection of Human Subjects: 45 CFR Part 46*, US 2005. See also: Privacy Advisory Committee, Canada, *CIHR Best Practices for Protecting Privacy in Health Research*, 2005, p 78; and National Health and Medical Research Council, Australia, *National Statement on Ethical Conduct in Research Involving Humans*, 1999, p 13.

through separate storage of coded or encrypted personal and identifying information; or by having the link between the codes or encryptions held by an independent third party. When an independent or trusted third party system[13] is properly operated, it is possible to link various items of personal data from different databases for research purposes, without revealing the identities of the individuals concerned.

4.15 We emphasise that the level of confidentiality safeguards, whether in the extent of de-identification or otherwise, should be commensurate with the potential risk to research participants. Generally, the confidentiality obligation of research institutions involved in large-scale research initiatives will be greater than that of research performed by a single researcher. In addition, researchers must comply with all regulatory requirements governing the confidentiality of information received from any custodian of personal information.

Recommendation 5: Privacy and confidentiality safeguards should be commensurate with the potential risk of harm from disclosure, and should be proportional to the sensitivity of the information and the kind of research being carried out. When reversibly de-identified information is used for research, IRBs should consider the adequacy of the extent and means of the de-identification in proportion to the risk.

[13] For a discussion on the trusted third party system and an illustration, please refer to the position paper in Annex A of this Report, on "Ensuring Data Privacy in Biomedical Research Involving Record Linkages" by Prof Chia Kee Seng.

V. Informed Consent

5.1 Generally, the use of personal information in biomedical research requires the voluntary and informed consent of the individual concerned and the approval of an IRB. In many situations, a researcher will only require access to reversibly de-identified personal information. In these cases, specific consent need not be obtained if the individuals have earlier provided a general consent for their personal information to be used for research, and the research has been approved by an IRB.

5.2 Specific consent is consent for a specific research project or for a specific purpose. General consent is consent that does not limit the use of the information or tissue contributed for a specific project or purpose. General consent is thus usually taken for future research, when no specific project has been planned. When a general consent is to be taken, patients or research participants must be given sufficient explanation to make an informed decision and be assured that all future research has to be approved by an IRB, with safeguards to protect their privacy and the confidentiality of their personal information.

5.3 Medical confidentiality requires that a patient's consent be obtained before his or her medical information may be used in research. Such consent requires that appropriate meaningful information should be provided to the individual. This obligation arises from the requirement that an individual's involvement in research must be voluntary. Even if the information is de-identified, the individual concerned must at some point have consented to the use of his or her information in research unless such research falls within the limited exceptions discussed below.

5.4 The need for informed consent and to safeguard privacy and confidentiality are two separate and necessary requirements for the use of personal information in research. The fact that consent has been obtained does not mean that privacy and the confidentiality obligations are abrogated. Similarly, even if privacy and the confidentiality of personal information are assured, informed consent must still be obtained in order for it to be used in research. This acknowledges the principle of autonomy by which individuals are held to have the right to determine how their information is used.

5.5 While the general ethical requirement is that informed consent must be obtained for the use of personal information in biomedical research, there are arguably certain exceptions. The provision of medical information by physicians to national disease registries is one such case that we discuss in Section B below. In addition, the experience of scientifically advanced countries suggests the need of a mechanism whereby the consent requirement may be dispensed with in exceptional situations involving research that poses minimal risk to the

individuals concerned and advances public benefit. Such research usually relates to public health, and certain bodies or authorities (such as an IRB or a government agency) are empowered by legislation to determine if research access should be permitted. In Section B, we propose that a similar mechanism be established in Singapore. But first, we consider the manner in which consent requirements should take into account the principle of proportionality.

Section A: Consent and Proportionality

5.6 It is of the nature of informed consent that one must consent with understanding. It should be self-evident that the language, occasion and manner of explanation, the level of detail offered, and the process by which the consent is taken, should all be aimed at helping the potential research participant understand what consent is being asked for. Provision of a large quantity of difficult information is not, in itself, a guarantee of understanding, which may require less information and more explanation.

5.7 Informed consent is generally required for obtaining personal information or tissue samples for research. When personal information or tissue is to be stored and used for future research, additional consent should be obtained, whether the research participant is a patient or not. This additional consent may be a general consent, in that no specific type of research need be identified at the time of consent-taking.

5.8 When a research participant is also a patient, his or her consent for research use of personal information or tissue samples, including surplus tissue left over following medical diagnosis or treatment, should be separate from the consent needed for any treatment. If information or tissue obtained in the course of medical treatment is to be stored and used for future research, consent should also be sought. This additional consent for future research use may be a general consent. It can be taken prior to treatment, or subsequent to it, depending on circumstances and it has to be taken in a timely and sensitive manner.[14]

5.9 In instances where patients may be potential research participants, we reiterate that particular caution is necessary when the attending physician is also the researcher, lest patients feel under an obligation to their physicians. IRBs should be sensitive to this possibility, and where the risk of pressure on a prospective research participant is seen as significant, IRBs may require an independent competent third party to take consent.

[14] Paragraph 8.3 of the *Human Tissue Research* report (2002) of the BAC states: "It is beyond our remit to suggest how valid requirements of consent be formally met. We cannot prescribe the particulars of how consent should be formally obtained, and we take the view that it is the responsibility of institutions to work out their own consent procedures and consent forms with their legal advisors, and to train their staff accordingly." This remains the view of the BAC.

5.10 At the time when a general consent is taken, researchers should provide the assurance that all subsequent research use of information or tissue would require the approval of an IRB, that such materials would not be used in ways likely to identify the research participant individually, that the research participant has the right to withdraw his or her consent at any time without giving any reasons and that if he or she is a patient, refusal to consent will not affect the quality of the medical care to which he or she is entitled. In addition, any expectation of commercial use of the information or tissue should be indicated. The extent of information to be provided will depend on the degree of actual or perceived risk.

5.11 Researchers and IRBs should be mindful of possible public sensitivity towards certain types of research. General consent is inappropriate for research involving the use of identified personal information or for sensitive research. If it is likely that personal information or tissue contributed by research participants may be used in any type of sensitive research, specific consent must be obtained. The UK Nuffield Council on Bioethics has considered certain types of genetic research that may be of public concern, such as those relating to personality, behavioural characteristics, sexual orientation or intelligence.[15] Where it appears to an IRB that an issue of public sensitivity may arise, the IRB may require specific consent to be obtained for the use of personal information or tissue, unless it cannot be used to identify participants, for example, through irreversible de-identification.

5.12 We stress, however, that biomedical research using personal information benefits the public through advances in medical science. It often requires the use of de-identified information, which carries little risk of harm. It would not be prudent to constrain such research by always insisting on the stringent standards needed to manage exceptionally sensitive information.

5.13 Accordingly, the process of obtaining consent should be detailed in proportion to the sensitivity of the research and the actual or perceived risk of harm to the individual concerned. Consent should be explicit and in writing[16] where the risk of harm to the individual is appreciable, for example, if tissue is sought for research via a surgical procedure, as in oocyte donation by healthy donors. In such cases the information provided should be correspondingly detailed. Where the risk is low or non-existent, less information may suffice for the individual to feel able to give consent.

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15 Nuffield Council on Bioethics, UK, *Genetics and Human Behaviour: The Ethical Context*, 2002.

16 Consent is legally valid whether it is in writing or not. However, putting consent in writing makes for easier resolution in the event of any dispute over whether consent was taken or what was consented to. It is generally desirable in research, where the researcher is the party requesting information or tissue samples. In the case of consent for clinical procedures, existing conventions for taking consent will apply.

5.14 Personal information or tissue that is provided for research by way of a general consent may be used in subsequent research without further consent. This relieves the researcher of the need to re-contact the individual concerned for specific consent. So long as the individual was fully informed and agreed to the future research application of his or her personal information or tissue, we are of the view that consent has been obtained, although other ethical obligations (such as to undergo IRB review and to keep the information secure and confidential) will continue to apply. If the individual is also a patient, the consent-taking process must allow the patient to decline without prejudice to his or her treatment.

5.15 In summary, we are of the view that specific consent is required for sensitive research or when the research involves identified personal information or tissue samples. General consent should be a sufficient requirement for subsequent unspecified research, subject to de-identification of the information and tissue as well as IRB review. Re-consent for future research is then not necessary.

Recommendation 6: Specific consent should be obtained for sensitive research or when the research involves identified personal information or tissue samples. General consent should be a sufficient requirement for subsequent unspecified research involving the use of de-identified information or de-identified surplus or stored tissues. The information to be provided to the individual when taking consent should depend on and be proportional to the sensitivity of the research and the risk of harm.

Section B: Consent and Reciprocity

5.16 Essentially, the consent requirement ensures that an individual's decision to participate in research by providing personal information (whether subsequently de-identified or not) is a free choice. However, the value of free choice does not supersede all other values in our society. Similarly, freedom from intrusion into one's private life is not an absolute value. There are circumstances where other legitimate public interests take priority.

5.17 In our Human Stem Cell[17] and Genetic Testing and Genetic Research[18] reports, the guiding principles of 'justness' and 'sustainability' highlighted the need to respect the common good of both present and future generations, together with the importance of fair sharing of social costs and benefits. The reciprocity implied in these principles also applies in research; research depends on informed voluntary contributions or participation, and need not benefit the participants, but it benefits others in the future.

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17 BAC, *Ethical, Legal and Social Issues in Human Stem Cell Research, Reproductive and Therapeutic Cloning*, 2002, Chapter 7, paragraph 3.

18 BAC, *Genetic Testing and Genetic Research*, 2005, paragraph 4.38.

5.18 While it is generally accepted that the requirement of informed consent is important, as it acknowledges the principle of autonomy, this principle should not be rigidly applied, but should be considered in relation to the risk of harm to research participants, and the value of the research where important public interest may be served. Procedures for obtaining consent from research participants were considered in a UK report, in this case for the collection and retention of biological samples that could be used for genetic analysis.[19] The report recommended that consent procedures include notice to prospective research participants that:

> "(i) the medical treatment that all receive is based on studies carried out on very many earlier patients and that the request is for them to provide similar help for future generations;
>
> (ii) because medical science is changing very rapidly, some of the valuable uses to which the data could sooner or later be put are not foreseeable".

5.19 These recommendations entail the principle of reciprocity. This is the idea that accepting benefit from past medical research, inherent in the utilisation of medical services, carries some expectation of a willingness to participate in research for the common good or public interest. This is an especially important consideration in societies, including Singapore society, where individuals are seen as incurring obligations to others through their membership of and roles in society. In the wider public interest, therefore, we see the principles of autonomy and reciprocity as complementary.[20]

5.20 In general, under the principle of reciprocity, one might presume that de-identified information should be available for benevolent purposes. In a similar vein, de-identified information extracted from clinical records or from tissue collections should be available, provided the research is IRB-approved. The goal of ethics guidelines is to ensure ethical propriety in the conduct and regulation of biomedical research. Such guidelines are intended to promote a culture of confidence that facilitates rather than hampers responsible research.

5.21 There are many important uses of personal and medical information that do not contribute directly to the healthcare of individuals, but are beneficial to society. These uses include epidemiological research and public health protection requirements, where personal information may be used without the explicit consent of individuals concerned. Such uses are likely to promote public welfare without posing risk of harm to individuals concerned and are gaining ethical endorsement internationally, under the principle of reciprocity.

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[19] House of Lords' Select Committee on Science and Technology, UK, *Fourth Report: Human Genetic Databases: Challenges and Opportunities*, 2001, paragraph 7.65.

[20] See the position paper in Annex A on "The Use of Personal Information in Biomedical Research: Some Philosophical Issues" by Associate Professor Nuyen Anh Tuan and the written submission by Majlis Ugama Islam Singapura in Annex D of this Report.

Disease Registries

5.22 The National Disease Registries Office (NDRO) was established in 2001 as a department under the Health Promotion Board to manage and develop the Singapore Cancer Registry, the Singapore Renal Registry and the Singapore Stroke Registry. Apart from these registries managed by the NDRO, other national disease registries in Singapore include the Singapore Myocardial Infarction Registry, the National Thalassaemia Registry, the Singapore Myopia Registry and the National Birth Defects Registry. These registries collect patient information, analyse the data and report incidence and trends of diseases in Singapore. Their work is critical to sound public health policy formulation and programme planning, as well as for research in general. For example:

(a) A recent study on trends in cancer incidence in Singapore from 1968 to 2002 relied on data derived from the Singapore Cancer Registry and other sources. In the last 35 years several types of cancer have increased, but cancers of the stomach, liver, oesophagus and nasopharynx have declined substantially;[21]

(b) About 10,000 Singaporeans are admitted into hospitals for strokes and transient ischaemic attacks every year, thereby making stroke the fourth leading cause of death;[22]

(c) Research using data drawn from the Singapore Myocardial Infarction Registry from 1988 through 1997 indicated that women who have heart attacks tend to be older than men and are more likely to have prior ischaemic heart disease, atypical symptoms and worse prognosis than men if they are aged 64 years or below;[23] and

(d) In 2000, it was found that 47% of all new cases of end-stage kidney disease in Singapore were due to complications of diabetes, making Singapore the country with the second highest incidence of such cases of kidney failure in the world. This finding is important for devising preventive measures.[24]

5.23 Not surprisingly, all major scientific countries have established disease registries. However, when many of these countries first implemented personal information protection regimes, a disproportionate emphasis was placed on the

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21 Singapore Cancer Registry *Report No. 6: Trends in Cancer Incidence in Singapore 1968–2002*, 2004, p 34.

22 National Neuroscience Institute, *Community-Based, Tri-Racial, Cross-Sectional Study on Prevalence of Stroke among Chinese, Malay and Indian Singaporeans*, www.nni.com.sg/Newsroom/MediaRelease/Stroke+Prevalence.htm (accessed Mar 20, 2007).

23 R Kam, et al, "Gender Differences in Outcome After an Acute Myocardial Infarction in Singapore," *Singapore Medical Journal* 43 (2002): 243.

24 A Vathsala and HK Yap, "Preventive Nephrology: A Time for Action," *Annals of the Academy of Medicine* 34 (2005): 1-2.

need to obtain specific consent from patients before information in their medical records could be disclosed to such registries by physicians. In many of these countries, epidemiological research, as well as public health research, was severely affected as a result.[25] In Part III above, we have noted our concern to prevent a similar occurrence in Singapore.

5.24 Medical information is protected by medical confidentiality and may not ordinarily be disclosed without the consent of the patient concerned. However, it is important to understand that it is inappropriate to apply a strict informed consent requirement for every kind of biomedical research using medical information. The UK Academy of Medical Sciences clearly identified problems that can arise:[26]

(a) It may be impracticable to seek consent for a number of reasons, including temporal or geographical distance, and insupportable time and expense. Researchers have in the past analysed and linked thousands of medical records with data from other sources (including death records). These patients were not contacted for consent to use their information for research, and it would have been impossible to do so since many had died. However, confidentiality safeguards were observed so that the privacy interests of these patients were protected. Such research allowed the identification of risk factors for diseases, enabling preventive measures to be taken;

(b) Strict insistence on informed consent may compromise effective population coverage, which is critical for population studies and disease registries. If many people decline, the data may no longer be representative, especially since the difficulties of obtaining consent are higher for certain segments of populations, such as the legally incompetent, the elderly or the socially disadvantaged. In such circumstances, a requirement for informed consent can lead to a significant bias or diminution in the quality of the data, which may be rendered useless;

(c) Patients may be inconvenienced or distressed at being contacted for the use of their personal information in research. There are also patients who do not wish to be reminded of a disease diagnosis or may be in denial; and

(d) The reliability and generalisability of studies may be reduced, since a strict consent requirement will increase the cost of such studies, thereby

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[25] J Illman, "Cancer Registries: Should Informed Consent Be Required?" *Journal of the National Cancer Institute* 94 (2002): 1269-1270; and JR Ingelfinger and JM Drazen, "Registry Research and Medical Privacy," *New England Journal of Medicine* 350 (2004): 1542-1543.

[26] The Academy of Medical Science, UK, *Personal Data for Public Good: Using Health Information in Medical Research*, 2006, pp 58-61.

leading to smaller study size and larger random errors. In some cases, consent may introduce unacceptable bias into the research findings and penalise some groups (such as schizophrenic patients).[27]

5.25 As a matter of ethics, the use of medical information to secure or advance public health in a way that does not prejudice the patients concerned is an important practical expression of the principle of reciprocity. Existing patients are receiving the benefits of improved medical care through the use of medical information from past patients for research. There is little ethical justification for them to refuse a similar use of their medical information where their interests are not likely to be compromised. The principle of autonomy should not be applied mechanically, such that epidemiological and public health research directed at advancing the common good of improved medical care for future patients is hampered without good cause. Accordingly, we consider it to be ethically acceptable for medical information to be disclosed by physicians to national disease registries provided that adequate privacy and other ethical safeguards that we have discussed in this Report are in place, and that patients are appropriately informed. The essential principle is that the privacy of the patient should be primarily protected by appropriate privacy safeguards, rather than by the exercise of patient discretion in the use of information for the general good.

5.26 We have considered the experience of scientifically advanced countries that share a common legal heritage with Singapore. It appears that an ethical position on the disclosure of medical information for the purposes of important epidemiological and public health research may not be adequate in the absence of clear common law precedents, and legislative action may be required. Recently, the provision of medical information to a cancer registry for public health purposes became the subject of controversy in the UK.[28] The question was whether the provision of medical information to such a registry and its subsequent use in research required patients' consent, and if it did, at what point and in what form. The main concern was the possibility that individuals might be identified. As a result, the UK Government had to introduce new legislative and regulatory guidelines in 2001 to put transfer of medical information to these registries on a sound legal footing.[29] Safeguards were proposed to ensure the anonymity of those on the registry to the fullest extent possible.[30] These guidelines allow disclosure of medical information to the cancer registry and for the registry to use such information for biomedical research that serves the general good, even without consent.

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27 L Roberts & S Wilson, "Argument for Consent may Invalidate Research and Stigmatise Patients", *British Medical Journal* 322 (2001): 858.

28 House of Lords' Select Committee on Science and Technology, UK, *Fourth Report: Human Genetic Databases: Challenges and Opportunities*, 2001, Chapter 7.

29 Health and Social Care Act (2001), UK, Section 60; and *Statutory Instrument 2002 No. 1438, The Health Service (Control of Patient Information) Regulations,* 2002.

30 For instance, Section 61 of the Health and Social Care Act (2001), UK, requires the Secretary of State to act upon the advice of the independent statutory Patient Information Advisory Group.

5.27 Similar developments have also been observed in the legal and regulatory landscapes of Australia and Canada, and in certain non-common law countries. For instance, the Swedish Personal Data Act (1998) provides that sensitive personal data may be processed for research and statistics purposes, even without the consent of patients, provided that the processing is necessary and that the interest of society is greater than the risk of improper violation of the integrity of the patients concerned. It further provides that research ethics committees or IRBs must approve the processing of personal information. Integral to this arrangement is the requirement that hospitals and custodians of personal information must consider privacy and confidentiality concerns before allowing access to personal information.

5.28 We generally consider these developments to be positive. In the past, it may have been acceptable for public healthcare institutions in Singapore to provide medical information to government entities for epidemiological or public health purposes. However, these healthcare institutions have been privatised in recent years and it has become unclear if government entities are able to require disclosure of medical information without the explicit consent of the patients concerned. In addition, the legality of non-consensual disclosure of sensitive medical information to public health authorities for the protection of public health has long been recognised and provided for under the Infectious Diseases Act (Cap. 137). Under this legislation, a physician, or indeed anyone who has reason to believe or to suspect that an individual is suffering from a specified infectious disease (such as the Severe Acute Respiratory Syndrome, or SARS) or is a carrier of that disease, is required to notify the Director of Medical Services. While infectious diseases continue to be of grave concern to public health authorities, many more Singaporeans are today affected by conditions that are serious but not infectious, such as cancer, heart disease, renal disease and stroke. These conditions are the primary interest of national disease registries, and they are of no less public health significance.

5.29 As such, we recommend that the relevant government authorities consider adopting measures similar to those in the abovementioned countries, in order to enable the disclosure of medical information to national disease registries subject to privacy safeguards. Such disclosure should be made by all physicians, whether practising privately or in public institutions. These measures should include mechanisms to allow the use of registry information in important epidemiological research and public health research, because it is almost always impossible or impractical to obtain consent from all patients and there is little or no risk of harm to those concerned.

Epidemiological Research and Public Health Research

5.30 Apart from medical information in disease registries, personal information held in other national registries, such as the Registry of Births & Deaths, is also an invaluable resource for important biomedical research (typically epidemiological

research). From an ethical perspective, it can be argued that reversibly de-identified information could be released from disease registries and other national registries for such research, provided that adequate de-identification and privacy safeguards are in place. Technical and organisational systems that permit linkage of data exist, such that information needed for research can be made available without prejudicing the privacy of the persons to whom the data relate. A system of this kind provides an ethical method of protecting privacy.

5.31 The informed consent of individuals concerned is generally required before identified information about them may be used. In addition, if it is anticipated that such identified information would be shared with other researchers or used in other research, then the consent obtained should reflect agreement to such extended use. However, this consent requirement need not apply to the use of reversibly de-identified information in epidemiological research and public health research.

5.32 Important public health justification, with minimal risk of harm to individuals, has been considered in some jurisdictions to provide sufficient justification for the research use of personal information without the need to obtain informed consent.[31] The types of research that typically qualify for such special treatment are epidemiological research and public health research. In many of the scientifically advanced countries, legal mechanisms have been implemented to facilitate such use. For instance, in Australia and Sweden, ethics review committees are empowered to make such public interest valuations.[32] Section 60 of the UK Health and Social Care Act 2001 was similarly enacted to mitigate the strict consent requirement.

5.33 In the light of these precedents, we take the view that it is ethically acceptable for researchers conducting IRB-approved epidemiological research and public health research to be allowed access to personal information from disease registries and other national registries, without the usual consent requirement, if the risk is minimal and safeguards are adopted for the protection of patient's privacy. Various mechanisms are available to allow research access to personal information in ways that do not significantly compromise confidentiality and privacy concerns. We consider the availability of such mechanisms to be to the general good. Some of these mechanisms may only be put in place through legislative means and we recommend that the relevant authorities consider establishing them.

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[31] National Health and Medical Research Council, Australia, *National Statement on Ethical Conduct in Research Involving Humans*, 1999, paragraph 14.4; Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada and Social Sciences and Humanities Research Council of Canada, *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*, 2005, article 2.1c; and Office for Human Research Protections, US, *Federal Policy for the Protection of Human Subjects: 45 CFR Part 46*, 2005, §46.116.

[32] Privacy Act (1988), Australia, Section 95; National Health and Medical Research Council, Australia, *Guidelines under Section 95 of the Privacy Act 1988,* 2000, clauses 2.4 and 3.3; and Personal Data Act (1998), Sweden, Section 19.

Recommendation 7: We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to national disease registries by physicians; and establish mechanisms enabling national registries and healthcare institutions to facilitate the use of personal information held or controlled by them for biomedical research that can significantly advance the public good, while safeguarding privacy.

Use of Medical Records in Biomedical Research

5.34 In a healthcare institution, all personnel who handle medical records are under a legal and ethical obligation to observe the confidentiality of the information in the records and to safeguard the privacy interests of patients concerned. We are of the view that a similar obligation should extend to any other person coming into contact with medical records.

5.35 Medical records are likely to be increasingly electronic in nature. The Electronic Medical Record Exchange (EMRX) is an initiative of the Ministry of Health (MOH) to enable hospitals and polyclinics from the two healthcare clusters, Singapore Health Services and National Healthcare Group, to electronically share medical information for better patient care.

5.36 The MOH has identified the benefits of the EMRX to be:

(a) improvement to the quality of care provided;

(b) increase in safety, since patients' drug allergies and current medications will be readily accessible to attending physicians; and

(c) reduction to medical cost, as physicians can now view the results of any recent blood tests, X-rays and investigations online without having the need to repeat such tests.[33]

5.37 Currently, only physicians and healthcare staff involved in the care of a patient may legitimately access that patient's information in the EMRX, and information protection safeguards have been implemented. The MOH does not permit research access to information in the EMRX. However, information in the EMRX may be a potential source of personal information for research. If research access were to be considered, the ethical principles of informed consent and confidentiality would apply. This also applies to institution-based disease databases, created primarily for patient care.

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[33] Ministry of Health, Singapore, *Electronic Medical Record Exchange (EMRX) - Sharing of Hospital Inpatient Discharge Summaries across Public Healthcare Clusters*, 2004, www.moh.gov.sg/corp/about/newsroom/pressreleases/details.do?id=18382854 (accessed 20 March, 2007).

5.38 Much valuable medical knowledge has resulted from the study of patients' medical records and there is every reason to encourage this established practice, provided patients' privacy interests are safeguarded. Some of these studies have led to improved patient care, others to a better understanding of the nature of specific diseases and their treatment.

5.39 We therefore recommend that IRBs be legally empowered to waive the patient consent requirement in situations where the research involves only the use of medical records, with no patient contact[34]. For such research, IRBs should be satisfied that:

(a) the research is justified and poses minimal risk of harm to the patients concerned;

(b) the research would not be possible without the use of medical records;

(c) there are appropriate safeguards to protect patients' privacy and the confidentiality of their information;

(d) obtaining consent is not possible or practicable; and

(e) the researchers are professionally and legally bound through appropriate contractual terms and undertakings to maintain patient privacy and the confidentiality of medical information.

5.40 The findings of research based on medical records may subsequently be published. Such publications do not and should not include any identified patient information. Photographic images may sometimes be included to support or illustrate the findings, and these too should not identify the patient concerned unless specific consent has been obtained. We note that anonymity is in any case required by journal editors, who will only publish identified patient information with the patient's explicit consent.

5.41 Healthcare institutions should develop procedures to inform patients that their medical records may sometimes be used for research and explain the reasons for such research. They should also assure patients that all research will require the approval of an IRB, that there are safeguards to protect their privacy and the confidentiality of their medical information, and they should answer any questions patients may have.

Recommendation 8: We recommend that IRBs be legally empowered to waive the patient consent requirement for research involving only the use of medical records, while ensuring patient privacy and confidentiality of medical information.

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[34] In paragraph 3.15 (a) of the report *Research Involving Human Subjects: Guidelines for IRBs* (2004), the BAC suggested that writing up or reporting individual patients' clinical results by their doctors could be exempted from IRB review. This remains the view of the BAC.

5.42 Table 1 and Chart 1 on pages 42 and 43 summarise the consent requirements for the use of personal information and tissue in research.

Section C: Additional Considerations about Consent

Vulnerable Persons

5.43 Vulnerability may be thought to occur if an individual's ability to give informed and voluntary consent is compromised or if he or she would be at heightened risk of adverse consequences from the research. In our Genetic Testing and Genetic Research report[35] we identified three common categories of vulnerable persons, namely:

(a) children and adolescents;

(b) the mentally impaired; and

(c) persons in dependent relationships: such persons include but are not limited to students, junior research assistants, medical or paramedical staff, personnel under military discipline, or prisoners.

5.44 Vulnerable persons raise particular ethical issues in research, especially where consent is concerned. This is because their individual interests must be considered, if necessary by proxy, and their participation sought only when other research participants are unavailable or unsuitable. As a group, however, they may have a particular interest in the benefits of research, and participating in research can sometimes be regarded as also serving their collective interest.

5.45 Where personal information is concerned, it is our view that individuals in these categories are entitled, as a general rule, to the same considerations of privacy and protection as any other research participants.

5.46 In the case of children and adolescents, and still more in the case of infants, much of their personal information is naturally known to parents or guardians. It is the responsibility of researchers to ensure on the one hand that parents or guardians are appropriately informed when consent for their children to participate in research is sought, and on the other that children or adolescents are also informed and their consent sought, in a manner appropriate to their level of understanding. We emphasise that persons responsible for the care of children and adolescents should only act in the best interest of the latter. This 'best interest' principle also applies when such a person is to provide informed consent on behalf of a child or an adolescent for the use of his or her personal information in research. In any case, personal information relating to infants,

[35] BAC, *Genetic Testing and Genetic Research*, 2005, paragraphs 4.8-4.18.

children and adolescents should be accorded the same privacy protection by researchers, as would be granted to information from any consenting adult.

5.47 In the case of mentally impaired persons who are legally incompetent, a similar principle applies. Consent to participate in research may be managed by persons who are authorised by law to make such decisions on their behalf and they are obliged to consider the best interest of such persons in their care. In any event the research participant should be involved as far as possible in the decision process, and enjoy the same privacy safeguards with respect to personal information as any consenting adult of sound mind.

5.48 In the case of dependent persons, it is important to avoid situations where an individual might feel obligated to participate in research. For example, serving National Servicemen may feel obliged to give consent to those with authority over them, and it would be desirable for an IRB to consider if consent-taking should be undertaken by an independent third party rather than through the line of command. Similarly, it might be wise for researchers not to rely on their own staff or students to serve as research participants. Notwithstanding considerations of consent, however, we again stress that personal information from dependent participants should enjoy the same protection as that of any other participant.

5.49 We are therefore of the view that IRBs when reviewing research proposals should take note of cases where research participants might appear to be vulnerable, and satisfy themselves that any concerns over the informed and voluntary nature of the participation are appropriately addressed.

Recommendation 9: We recommend that IRBs, when reviewing research proposals, ensure that any concerns in regard to vulnerable persons are appropriately addressed.

Withdrawal of Consent

5.50 Regardless of how a research participant is involved (whether in the provision of tissue, personal information or other forms of involvement), he or she should be able to withdraw consent to participate at any point. Researchers should assure potential participants that no reason need to be given for withdrawing consent and that such withdrawal will not compromise the quality of any care or entitlements that might be given to them or their families, where applicable.

5.51 Research participants need to be aware that it may or may not be possible to identify and remove their data or tissue samples from a research project, should they withdraw. Participants may, in any case, be willing to allow their information or tissue to be used, after they withdraw, provided they themselves have no further involvement with the research. The essential principle is that the participant needs to be aware, when they consent to participate, of the procedure for withdrawal and its implications.

Recommendation 10: Research participants should be allowed to withdraw their consent to participate in the research at any time without explanation and without prejudice, and should be informed of the procedure for withdrawal and its implications when consent is sought.

VI. Access to Medical Information by Employers and Insurers

6.1 Medical information should not be disclosed to a third party without the individual's consent. However, there are circumstances where a person may be required to make available his or her medical information in order to obtain access to certain economic, political or social goods. The possibility and extent of access to medical information by third parties is very relevant to public confidence in the capability of existing healthcare institutions to safeguard the interests and welfare of individuals. In this Part, we focus on access to medical information for two main non-therapeutic and non-research purposes: obtaining employment and obtaining insurance coverage.

Employers

6.2 An employer is reasonably entitled to ensure that a prospective employee is able to meet the requirements of the job by virtue of good health, either before or during employment. Many employers in Singapore do take into account the health status of job applicants, particularly if they provide employees with some measure of health insurance.

6.3 Employers will often arrange for prospective employees to undergo a medical examination with the understanding that acceptance for employment is subject to satisfactory medical examination. Pre-employment medical examination is considered acceptable so long as the information derived from the examination is relevant to the nature of the job that the prospective employee is expected to undertake. However, the usual ethical obligations attending medical information apply even though such information is not held by an employer for the purposes of healthcare provision or biomedical research. Once an employee leaves the employment, or if an employer declines to employ an applicant, the relevant medical reports should be carefully disposed of by the employer within a reasonable time.

6.4 Employers might also wish to carry out specific medical tests on applicants or employees. For instance, employers might seek to conduct tests to reduce workers' compensation claims, to meet occupational health and safety obligations, or to increase productivity, by screening out employees who are most likely to be absent from work due to illness. In addition, the testing could potentially take the form of predictive genetic testing in an attempt to identify if an individual who is currently asymptomatic has a genetic profile that increases the likelihood that he or she will develop a disorder as a result of the workplace environment.

6.5 The usefulness of predictive health testing of any kind, whether genetic or not, depends heavily on the validity of the tests as predictors, the level of probability associated with any prediction, and the nature of the effects of the disease or

disorder. As gene technology is still very much in its infancy, there is often a high level of uncertainty in the predictive value of genetic information. We are concerned that potential employers may discriminate on this basis. Even for monogenic diseases, it is usually not possible to predict the severity or time of onset of the disease in question and there is the possibility that the disease may not even manifest itself during the working life of the individual.

6.6 An employer may not arbitrarily discriminate against a prospective employee on irrelevant grounds without ethical compromise. This issue can arise if employers discriminate on grounds of age, gender, race or religion, for example. In general we take the view that merit in the form of ability to do the job is the important criterion. In a similar way, discrimination based on the possibility of developing late-onset health problems, or on relatively irrelevant or minor health grounds, would be difficult to defend. However, a measurable and relevant impairment of ability, at the time of application or soon thereafter, incurs a cost on an employer, and may entail a risk to the employee or to the public.

6.7 We are of the view that genetic testing should not be part of pre-employment medical examination. However, we agree that the use of valid genetic or other health testing by employers is appropriate to address imminent health and safety concerns, or where the detected or predicted condition is incompatible with the requirements of the job, especially insofar as these affect third parties.

Insurers

6.8 In order to obtain life and health insurance, a person may be asked to provide detailed information about his or her health, the health of his or her parents and siblings, and certain lifestyle information such as smoking and drinking habits. A person may also be required to undergo a medical examination. The possibility of including predictive genetic test results as part of this information has surfaced as a concern in several jurisdictions.

6.9 There are costs to an insurance company if it is denied relevant health or medical information, genetic or otherwise. These costs are borne by other policy holders. A system of national insurance can absorb this cost in the public interest of avoiding an uninsured population, but private insurers are not under any obligation of this nature.

6.10 Concealing relevant information to which an insurance company is entitled may void a policy. If the insurance company is not entitled to the information but the policy applicant has it, an 'adverse selection'[36] situation is created. On the other hand, it is not in the public interest, that individuals become reluctant to

[36] For a discussion on adverse selection, see paragraphs 2.8–2.10 and 2.15 of the position paper by the Life Insurance Association of Singapore on "Genetics and Life Insurance" in Annex A of this Report.

undergo necessary genetic or other health testing for fear of having to disclose the results. If this were to occur, both the ability of physicians to provide the best healthcare to patients and the potential benefits of biomedical research could be reduced.

6.11 We recognise the potential adverse selection problem that may arise as a result of inequality of information and that risk evaluation for the purposes of determining insurance coverage involves discriminating between applicants. However, we empathise with the public's concern over possible unreasonable discrimination in the availability of insurance coverage. It is reasonable to argue that the onus is on insurance companies to show that requested information can be used in valid ways, since the actual risk may be quite small and difficult to predict. Moreover, no one should be compelled to undergo genetic testing in order to obtain insurance coverage.

6.12 A detailed review was undertaken by the UK House of Commons' Select Committee on Science and Technology in 2001.[37] The Select Committee recommended that the Genetics and Insurance Committee (GAIC), a non-statutory advisory public body, closely monitor the situation to ensure that the insurance industry only use genetic test results approved by the GAIC.

6.13 Following the recommendations of the Select Committee, a 5-year moratorium was implemented by agreement between the UK Government and the Association of British Insurers in 2001. The moratorium has since been extended for another five years to 2011.[38] Under the moratorium, a person will not be required to disclose the result of a predictive genetic test unless the test has been approved by the GAIC (to date, only Huntington's Disease has been approved) and is for coverage of more than £500,000 of life insurance or £300,000 of critical illness insurance, or income protection insurance with annual benefits of more than £30,000.

6.14 We are of the view that a similar moratorium on the use of predictive genetic information could be considered in Singapore. This would allow time for both the insurance industry and the government to look into the substantive issues. Both parties should ensure that only relevant and reliable information is used in assessing insurance applications, and that the outcomes of the conditions considered are both serious and predictable, before considering lifting any such moratorium.

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[37] House of Commons' Select Committee on Science and Technology, UK, *Fifth Report: Genetics and Insurance*, 2001.

[38] Department of Health and Association of British Insurers, UK, *Concordat and Moratorium on Genetics and Insurance*, 2005.

Recommendation 11: We recommend that the government consider implementing a moratorium on the use of predictive genetic information for insurance purposes, consider the long-term implications of the accessibility of predictive genetic test results by employers and the insurance industry, and monitor developments in this area.

Table 1. The relationship between use of personal information or tissue and the consent requirements, as they are now or are proposed in this Report. The relevant Recommendations (Rec) in the Report are also indicated.

Flow-chart reference	Use of personal information or tissue	Consent	Report Rec No.
1	Obtaining information or tissue for specific research, from a research participant, whether a patient or not	Specific	6
2	Research using identified information or tissue (any source)	Specific	6
3	Research into sensitive topics or with information of a sensitive nature (any source)	Specific	6
4	Storing and using reversibly de-identified information for future research not of a sensitive nature	General	6
5	Storing and using reversibly de-identified tissue, including tissue surplus to clinical requirements, for future research not of a sensitive nature	General	6
6	Use of medical records for research with no patient contact	Conditional waiver by IRB[39]	8
7	Public health or epidemiological research with de-identified information	None	7[40]
8	Disclosure of medical information to national disease registries	None	7[41]
-	Research with legacy tissue collections	None if impracticable[42]	-

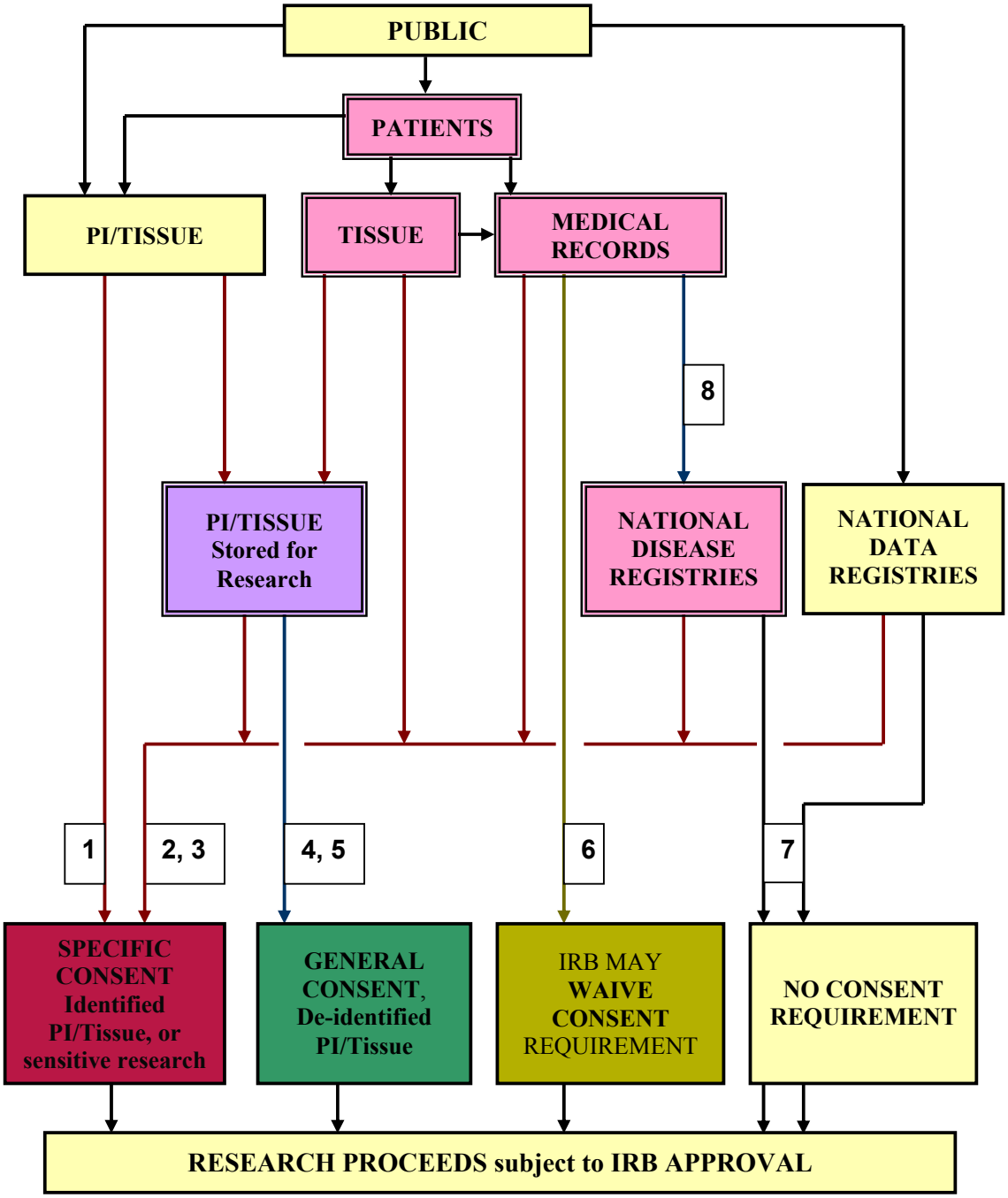
[39] The conditions whereby an IRB may decide to waive the consent requirement are listed in paragraph 5.39 of this Report.

[40] Read with paragraphs 5.22–5.33.

[41] Read with paragraph 5.29.

[42] Recommendation 1B of the BAC *Human Tissue Research* Report (2002) p 34.

Chart 1. Flowchart of personal information (PI) or tissue used in research requiring IRB approval. This Chart is to be read in conjunction with Table 1 which gives the relationship between research use of PI or tissue and the consent requirements, as they exist now or are proposed in this Report. Boxes with double outlines reflect wholly or partly clinical domains.



BIBLIOGRAPHY

Academy of Medical Science. *Personal Data for Public Good: Using Health Information in Medical Research*. UK, 2006.

Australian Law Reform Commission. *ALRC 96 Essentially Yours: The Protection of Human Genetic Information in Australia.* 2003.

Bioethics Advisory Committee. *Ethical, Legal and Social Issues in Human Stem Cell Research, Reproductive and Therapeutic Cloning*. Singapore, 2002.

Bioethics Advisory Committee. *Genetic Testing and Genetic Research*. Singapore, 2005.

Bioethics Advisory Committee. *Human Tissue Research*. Singapore, 2002.

Bioethics Advisory Committee. *Research Involving Human Subjects: Guidelines for IRBs*. Singapore, 2004.

British Medical Association. *Confidentiality as Part of a Bigger Picture – A Discussion Paper from the BMA.* 2005.

British Medical Association. *Taking and Using Visual and Audio Images of Patients: Guidance from the Medical Ethics Department*. 2004.

British Medical Association and Association of British Insurers. *Medical Information and Insurance: Joint Guidelines from the British Medical Association and the Association of British Insurers.* 2002.

Canadian Institutes of Health Research, *CIHR Best Practices for Protecting Privacy in Health Research*. 2005.

Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada. *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*. Ottawa: Interagency Secretariat on Research Ethics, 2005.

Council for International Organizations of Medical Sciences. *International Ethical Guidelines for Biomedical Research Involving Human Subjects*. Geneva, Switzerland, 2002.

Council for Science and Technology, Bioethics Committee. *Fundamental Principles of Research on the Human Genome*. Japan, 2000.

Data Protection Act, UK. London: Office of Public Sector Information/HMSO. 1998.

Department of Health and Association of British Insurers. *Concordat and Moratorium on Genetics and Insurance*. London: Department of Health, 2005.

Elger BS and Caplan AL. "Consent and Anonymization in Research Involving Biobanks: Differing Terms and Norms Present Serious Barriers to an International Framework." *European Molecular Biology Organization Reports* 7 (2006): 661-666.

European Parliament and the Council of the European Union. Directive 95/46/EC, *On the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of Such Data.* October 24, 1995.

European Society of Human Genetics. "Data storage and DNA banking for biomedical research: technical, social and ethical issues." *European Journal of Human Genetics* 11 Suppl 2 (2003): S11-S12.

General Medical Council. *Confidentiality: Protecting and Providing Information*. UK, 2004.

General Medical Council. *Research: The Role and Responsibilities of Doctors.* UK, 2002

General Medical Council. *Seeking Patients' Consent: the Ethical Considerations*. UK, 1998.

Genetic Interest Group. *Human Rights, Privacy and Medical Research: Analysing UK Policy on Tissue and Data.* UK, 2006.

Health and Social Care Act. UK. London: Office of Public Sector Information/HMSO, 2001.

House of Commons' Select Committee on Science and Technology. *Fifth Report: Genetics And Insurance*. London: Office of Public Sector Information/HMSO, 2001.

House of Lords' Select Committee on Science and Technology. *Fourth Report: Human Genetic Databases: Challenges and Opportunities*. London: Office of Public Sector Information/HMSO, 2001.

Human Genetics Commission. *Inside Information: Balancing Interests in the Use of Personal Genetic Data.* UK, 2002.

Human Genome Organisation Ethics Committee. *Statement on Benefits Sharing.* UK, 2000.

Human Genome Organisation Ethics Committee. *Statement on DNA Sampling: Control and Access.* UK, 1998.

Human Genome Organisation Ethics Committee. *Statement on Human Genomic Databases.* UK, 2002.

Ilman J. "Cancer Registries: Should Informed Consent be Required?" *Journal of the National Cancer Institute* 94 (2002): 1269-1270.

Infectious Diseases Act (Cap. 137), Revised Edition. Singapore, 2003.

Ingelfinger JR and Drazen JL. "Registry Research and Medical Privacy." *New England Journal of Medicine* 350 (2004): 1542-1543.

Joint Committee on Medical Genetics. *Consent and Confidentiality in Genetic Practice: Guidance on Genetic Testing and Sharing Genetic Information*. UK, Royal College of Physicians, Royal College of Pathologists and the British Society for Human Genetics, 2006.

Kaan T and Liu E, *Life Sciences: Law and Ethics. Recent Developments in Singapore.* Singapore: Bioethics Advisory Committee and Singapore Academy of Law, 2006.

Kam R, Cutter J, Chew SK, Tan A, Emmanuel S, Mak KH, Chan CNS, Koh TH, and Lim YL. "Gender Differences in Outcome after an Acute Myocardial Infarction in Singapore." *Singapore Medical Journal* 43 (2002): 243-248.

Knoppers BM and Saginur M. "The Babel of Genetic Data Terminology." *Nature Biotechnology* 23 (2005): 925-927.

Lowrance, WW. *Access to Collections of Data and Materials for Health Research: A Report to the Medical Research Council and the Wellcome Trust*. UK: Medical Research Council and The Wellcome Trust, 2006.

Lowrance, WW. *Learning from Experience: Privacy and the Secondary Use of Data in Health Research,* UK: The Nuffield Trust, 2002.

Medical Registration Act (Cap. 174), Revised Edition. Singapore, 2004.

Medical Research Council. *Personal Information in Medical Research*. UK, 2003.

Medical Research Council. *Human Tissue and Biological Samples for Use in Research - Operational and Ethical Guidelines.* UK, 2005.

Ministry of Health. *Electronic Medical Record Exchange (EMRX) - Sharing of Hospital Inpatient Discharge Summaries across Public Healthcare Clusters.* Singapore: Ministry of Health press release 30 March 2004. www.moh.gov.sg/corp/about/newsroom/pressreleases/details.do?id=18382854 (accessed 20 March 2007).

National Health and Medical Research Council. *Guidelines Approved under Section 95A of the Privacy Act 1988.* Australia, 2001.

National Health and Medical Research Council. *Guidelines for Genetic Registers and Associated Genetic Material.* Australia, 2000.

National Health and Medical Research Council. *Guidelines under Section 95 of the Privacy Act 1988*. Australia, 2000.

National Health and Medical Research Council. *National Statement on Ethical Conduct in Research Involving Humans*. Australia, 1999.

National Medical Ethics Committee. *Ethical Guidelines on Research Involving Human Subjects.* Singapore: Ministry of Health, 1997.

National Neuroscience Institute. *Community-Based, Tri-Racial, Cross-Sectional Study on Prevalence of Stroke among Chinese, Malay and Indian Singaporeans.* Singapore, Singhealth, National Neuroscience Institute, 27 April 2005. www.nni.com.sg/Newsroom/MediaRelease/Stroke+Prevalence.htm (accessed 20 March, 2007).

Nuffield Council on Bioethics. *Genetics and Human Behaviour: The Ethical Context*. London, 2002.

Office for Human Research Protections. *Federal Policy for the Protection of Human Subjects: 45 CFR Part 46.* US: Department of Health and Human Services, 2005.

Office for Human Research Protections. *International Compilation of Human Subject Research Protections, 2007 Edition*. US: Department of Health and Human Services, 2006.

Parliamentary Office of Science and Technology. *Postnote, Data Protection & Medical Research.* UK: Public Health Genetics Unit, 2005.

Personal Data Act. Sweden: The Swedish Data Inspection Board, 1998.

Privacy Act, 1988. Australia: Commonwealth Consolidated Acts, 1988.

Privacy Advisory Committee. *CIHR Best Practices for Protecting Privacy in Health Research.* Canada, 2005.

Seow, A, Koh WP, Chia KS, Shi L, and Lee HP. *Report Number 6: Trends in Cancer Incidence in Singapore 1968 – 2002*. Singapore Cancer Registry, Report No 6, 2004.

Singapore Medical Council. *Ethical Code and Ethical Guidelines*. Singapore, 1995.

Statutory Instrument. *Health Service (Control of Patient Information) Regulations.* London: Office of Public Sector Information/HMSO, 2002.

Thomson C. *The Regulation of Health Information Privacy in Australia: A Description and Comment.* Australia: National Health and Medical Research Council, 2004.

United Nations Economic Social and Cultural Organisation (UNESCO). *International Declaration on Human Genetic Data*. UNESCO, 2003.

Vathsala A and Yap HK. "Preventive Nephrology: A Time for Action." *Annals of the Academy of Medicine Singapore* 34 (2005): 1-2.

World Health Organization (WHO). Genetic Databases: Assessing the Benefits and the Impact on Human & Patient Rights. WHO, 2003.

World Medical Association. *Declaration of Helsinki*: *Ethical Principles for Medical Research Involving Human Subjects.* 2004.

World Medical Association. *Declaration On Ethical Considerations Regarding Health Databases*. 2002.

World Medical Association. *Statement on Genetics and Medicine*. 2005.

Position Papers

1. The Use of Personal Information in Biomedical Research: Some Philosophical Issues
   - *Associate Professor Nuyen Anh Tuan*
   Department of Philosophy, Faculty of Arts and Social Sciences, National University of Singapore

2. Ensuring Data Privacy in Biomedical Research Involving Record Linkages
   - *Professor Chia Kee Seng*
   Department of Community, Occupational and Family Medicine, Yong Loo Lin School of Medicine, National University of Singapore

3. The Importance of Research Using Personal Information for Scientific Discovery and the Reduction of the Burden of Disease
   - *Professor Edison Liu*
   Executive Director, Genome Institute of Singapore

4. Genetics and Life Insurance
   - *Life Insurance Association, Singapore*

THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH: SOME PHILOSOPHICAL ISSUES

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Biomedical science is not purely laboratory-based. Much of it involves extensive statistical analyses of data pertaining to human subjects. Vast quantities of data are collected and analyzed in order to establish hypotheses, to confirm or to reject them, and to test new drugs and new medical procedures. Data can be collected in the course of conducting research, or they can be retrieved from records and data bases. The data that can be interpreted are meaningful and once interpreted become information. Those data pertaining to human subjects can yield information about persons. As such they are personal data and the information they yield is personal information. With sufficient personal information, a person can be identified and various aspects of him or her can be known. Such knowledge can be used in ways that affect a person. Any conduct that affects others falls within the ambit of ethics. It follows that the use of personal information in biomedical research has ethical implications. Wherever there are ethical implications, there are ethical issues and concerns. In what follows three clusters of issues and concerns will be discussed: (1) Privacy and Confidentiality; (2) The Right to Privacy; (3) Right to Privacy Versus Obligations to Community.

1. Privacy and Confidentiality

1.1 Privacy

Privacy is essentially a situation in which a person finds himself or herself, vis-à-vis others in the world. This bare description does not show that it is something of value, or

something to which we can claim a right, or something over which we should have control. Arguments have to be advanced to demonstrate that privacy does have these latter characteristics. What kind of situation is privacy and why does it have these characteristics?

According to Ruth Gavison (Gavison 1995), a person's privacy is a situation constituted by the extent to which other persons have access to him or her. Privacy varies inversely with access. Access can be either informational or physical. To have informational access to someone is to possess information about that person, and to have physical access to someone is to have the means to gain physical proximity to that person. Informational access can facilitate physical access and conversely. At one extreme, access is nil and privacy is complete, and at the other access is unlimited and privacy is completely lacking. Both extremes are only theoretical, as no one is in a situation of complete privacy where he or she is totally cut off from the world, and no one is in a situation of zero privacy where he or she is fully transparent and physically accessible to the world. Real privacy is a matter of degree, well inside these two theoretical extremes.

Since privacy is understood in terms of access, it is possible for someone to lose privacy when the information to which others have access is vague, or inaccurate, or even false. Loss of privacy is not just a matter of how much is known about a person, which in turn depends on how much accurate or true information can be accessed. Vague, inaccurate or false information about someone does not make him or her better *known* but can still cause a loss of privacy if it draws others' attention to that person. Celebrities often lose their privacy because false rumors are circulated about them. Indeed, one of the main worries about privacy, as we shall see, is that inaccurate or false information is circulated, particularly when the affected person is unable to correct it.

We typically value our privacy. But why is privacy a thing of value? A number of arguments can be advanced to show that it is. Firstly, privacy is needed to protect and to advance certain personal interests. James Rachels (Rachels 1975) has identified many different interests that privacy helps to protect or advance, such as: (1) Interest in not

being placed in a competitive disadvantage, which would be the case if one's competitors had access to one's strategies and plans, (2) Interest in not being placed in embarrassing situations, which would be the case if others had access to embarrassing information about oneself, (3) Interest in protecting one's marriage, one's job, etc., which could be harmed if others (one's spouse, one's employer, etc.) had access to personal information, such as medical records, and (4) Interest in being assessed fairly in seeking insurance, credit, etc., which might be harmed if irrelevant personal information were available to insurers, credit providers, etc. It is important to note, something that Rachels does not do, that under this heading (and to some extent under (2) and (3)), false or inaccurate information may cause greater harms. Rachels goes on to say that these interests arise in unusual situations, in which personal information may be used against a person, and as such they do not highlight what is significant in privacy, namely its value in normal or ordinary situations, in which a person is not threatened with harm. In the latter situations, there is an interest in maintaining social relationships with others, which would be impossible if we cannot control who can have access to us. For instance, friendship depends, among other things, on being able to share certain personal information (and physical space) with a friend and to exclude others from it, information that need not be embarrassing or damaging.

Rachels is right in emphasizing the role of privacy in forming and maintaining social relationships. However, it would be wrong to downplay the significance of privacy in safeguarding those other interests that he mentions, particularly when it comes to biomedical information. Given the recent and anticipated advances in computer and information technology, the proliferation of sophisticated data bases, the vast quantities of biomedical data being collected, and the fact that personal biomedical information has the potential to be used to someone's disadvantage, the situations in which these interests may be adversely affected are much less "unusual," or much more "normal" or "ordinary" than Rachels believes.

In addition to promoting the interests identified by Rachels, privacy plays an indispensable role in promoting many other personal values. Ruth Gavison (Gavison

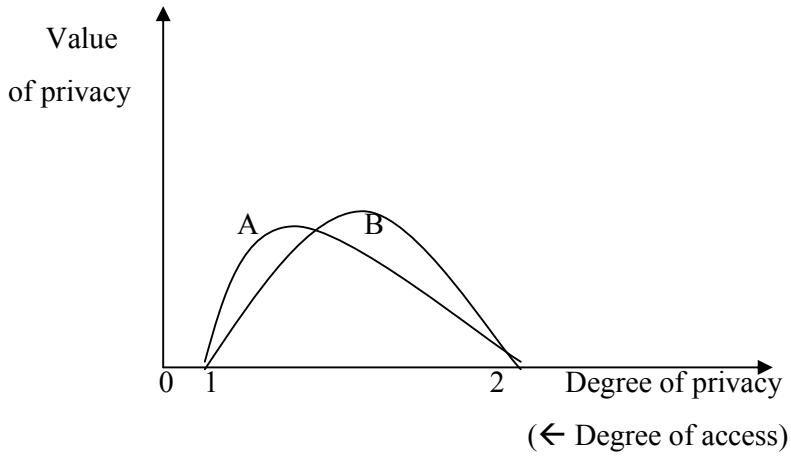
1995) mentions creativity, personal growth, mental health, autonomy and liberty. For instance, in the case of autonomy, privacy is necessary if we are to make decisions without undue influences or pressures. Through the promotion of these values, further values will be enhanced. Important among them are collective values such as democracy, which will be promoted with greater autonomy and liberty, and commerce, the success of which depends on there being trust, and trust depends partly on the confidence we have that access to personal information is not indiscriminate.

Finally, privacy in itself has a value, independently of other values and interests with which it is necessarily linked. It gives a person a "breathing space," a sense of solitude, a kind of inner peace that comes with the knowledge that one is not under the prying eyes of others. Indeed, it might be said that the degree of privacy a person has chosen to have is partly what defines his or her own individuality. Each one of us is who he or she is by virtue of, among other things, the private space in which we are enclosed.

If we accept that privacy is to be understood in terms of others' access to us, we have to accept that the value of privacy does not correlate with the degree of privacy over the entire range from zero privacy to complete privacy. Since "no man is an island," others' access to us, or our accessibility to others, to some extent, is important and valuable. Complete privacy, or being completely cut off from others, even if it is possible, is not a good thing, any more than complete loss of privacy. The relationship between privacy/access and the value of privacy can be understood in terms of the following diagram (Figure 1). The value of privacy is measured along the vertical axis, and the degree of privacy along the horizontal axis from left to right (and the degree of others' access to us from right to left). Curves A and B begin at Point 1 rather than Point 0 because complete lack of privacy, or total access, (Point 0) is impossible. The curves begin to rise after Point 1, indicating that the value of privacy increases as one has more privacy (or is less accessible to others), reaches a peak and then starts to decline as one becomes less and less accessible to others. At Point 2, well before complete privacy, or total inaccessibility, the curves touch the horizontal line, indicating

that the value of privacy has reached zero. Whether the curve skews to the left (Curve A) or to the right (Curve B) depends on personal circumstances: a person who deals a lot with others, such as a politician, or a movie star, or someone serving the community such as a priest, may need to trade off some privacy for more public accessibility, and his or her value curve will be more like Curve A rather than Curve B. On the other hand, an ordinary "private citizen" may have a value curve more like Curve B than Curve A.

Figure 1



1.2 Confidentiality

Given that privacy is a thing of value, there is a need to protect it, and given the inverse relationship between privacy and access as shown above, the way to protect privacy is to control access. More specifically, since privacy is of high value only within a certain range (which varies from person to person, see Figure 1), it would be good if we could control access in such a way as to maintain privacy within that range. In the case of physical access, we could do so by adapting our lifestyles to suit our individual circumstances, and also relying on laws that regulate physical access such as laws against trespassing, stalking, unauthorized surveillance and so on. In the case of informational access, control of access depends on the extent to which personal

information can be gathered, and the extent to which gathered information can be kept confidential.

Literally, the confidentiality of information is the trust placed on the person to whom the information is given (the "authorized" person) that he or she does not pass it on to others (the "unauthorized" persons). This literal sense comes from the etymology of the word "confidentiality" (*con* – together, mutual and *fidere* – to trust). Confidentiality is expressed in the confidence, or the trust, we have in the authorized person that he or she does not allow others to have access to the information. In many cases, confidentiality can be maintained through a system of trust. The context in which the information is generated or given is sometimes sufficient to indicate the confidentiality of the information, such as personal information revealed to a friend. In professional contexts, confidentiality is protected by ethical rules of professional conduct. However, it is often the case that those in possession of personal information are not clear what should be treated confidentially and how seriously confidentiality should be taken. The law may have to be resorted to for its protection, as failure to protect it will result in the loss of trust, or loss of confidence, which in turn damages the value of privacy.

Confidentiality is a matter of degree. Information can be highly confidential, or moderately confidential. The degree here is not the degree of trust, or confidence, which should be as high as possible. Rather it is the degree of access. Highly confidential information is highly inaccessible and moderately confidential information is moderately accessible. Since the degree of confidentiality varies with the degree of access, as does the degree of privacy, confidentiality is also a measure of privacy. Furthermore, since confidentiality can be objectively specified and monitored – there re standard ways of determining whether confidentiality is breached – it is through the control of confidentiality that we control privacy in its informational aspect (and indirectly, privacy in its physical aspect). Thus, the protection of privacy (in its informational aspect) can be accomplished through the protection of confidentiality, that is, restricting access to information only to authorized persons or authorities.

2. The Right to Privacy

2.1 Justifying the Right to Privacy

Just because something is of value, it does not follow that anyone has the right to it. We do take for granted that there is a right to privacy, but the basis for this right has to be established. There are a few ways of doing so.

On one line of reasoning, the right to privacy may be thought of as a property right. J.J. Thomson (Thomson 1975) claims that the right to privacy is a cluster of rights that intersect with the clusters of property rights (or right of ownership) and the rights over person (which are for her a kind of property right). If someone gains unauthorized access to my belongings, whatever they may be, and for whatever purpose, he or she has violated my right to privacy, insofar as I have the right to my belongings, a right based on my ownership of them and one that entitles me to decide who shall have access to them. If someone obtains information pertaining to me as a person without authorization, he or she has violated my right to privacy by violating my right over my person, a right that gives me control over my person. In a great number of cases, Thomson's account explains well enough why we think they are cases of invasion of privacy. However, the account seems inadequate when it comes to personal information of the biomedical kind. For instance, it is not clear whether a patient can claim ownership over the medical records kept by his or her physician, nor is it clear whether the physician's medical notes have anything to do with the patient's right over his or her person; yet it is clear that the indiscriminate dissemination of medical records is a case of violation of the right to privacy.

On a somewhat more promising line of reasoning, we can think of the right to privacy as derivative of the rights a person has to protect certain interests, such as those mentioned by Rachels above. Since interests may be harmed by certain kinds of informational and physical access, those that constitute invasion of privacy, the right not to be harmed translates into the right to privacy. However, as Rachels has pointed out, the value of privacy goes beyond the value of the interests that privacy helps to

protect. Privacy has value even when a person's interests are not under threat. The question is whether there is a right to privacy as a thing of value when no threat to a person's interests exists. Here, it may be suggested that there is a natural right to privacy. The idea of natural rights derives from the idea of natural laws. Religious thinkers, such as St. Thomas Aquinas, think of natural laws as the laws laid down by God to regulate human conduct. Non religious thinkers take them to be the laws that enable human beings to live well, given their natural tendencies. For instance, the prohibition against murder may be said to have its basis in a divine law against murder ("Thou shall not kill"), or a natural law based on the fact that human beings cannot live well unless they refrain from murdering each other. Given that there are natural laws (e.g. against murder), there are natural rights (e.g. the right not to be murdered). Insofar as privacy is required for a person to live well – it is necessary for a person to form relationships such as friendship, as noted before -- we can speak of a natural right to privacy. This claim is strengthened by the fact that, again as pointed out earlier, a certain degree of privacy is required for a person to live as an individual person, to see himself or herself as a person.

Unfortunately, the idea of natural laws/rights is controversial, particularly when it makes the transition from a legal doctrine to an ethical doctrine. Many influential thinkers, such as Bentham, have rejected it. One objection is that we cannot ground the ethical, or what ought to be the case, on the natural, or what is the case. So grounded, natural rights cannot be overridden (particularly if they are based on divine laws). This seems to be a serious objection when it comes to the right to privacy. As we have seen, the value of privacy is a balance between privacy and access. For an individual, there is always some trade-off between privacy and accessibility, a certain degree of the latter a person must allow, for his or her own good as a member of the society. Furthermore, as we shall see, accessibility also has a value from the community's point of view. Making the right to privacy a natural right that cannot be overridden does not allow for the balancing of privacy and access from both the individual and the communal points of view. However, this objection can be deflected by giving the natural rights idea a communitarian twist. John Rawls (Rawls 1971) has argued that certain rights can be

justified on the grounds that they would be the rights that we would insist on having, if we were in the "original position" of coming together to form a society and acting behind the "veil of ignorance," that is, not knowing about how well we would be doing in the society. He argues that under these conditions we would insist on the rights to "basic liberties," such as political liberty, freedom of thought and speech, freedom from arbitrary arrest and so on. These are the basic rights that we would not want to trade off for any other advantage. In addition to them, we would also insist on a host of other rights that would make life better, although we would be willing to trade them off for the benefit of all, particularly those who are worst-off. It follows that if there is a natural basis for the right to privacy, that is, if privacy is what we need in order to have a good life, then we can built it into a Rawlsian framework, and argue that there is a right to it on the basis that we would insist on it in the original position. However, since the freedom to live in privacy would not be part of the "basic liberties," the right to privacy can be traded off in ways that make life better for all, particularly the worst-off.

2.2 The Right to Privacy and Consent

As noted above, the protection of privacy can be accomplished by protecting the confidentiality of personal information. Given that there is a right to privacy, we can now speak of the right to confidentiality. Again as noted above, we can maintain confidentiality by restricting the collection and handling of personal information to those who are authorized to collect and handle such information. The right to confidentiality means that the person to whom the information pertains, or belongs, has the right to authorize access, that is, to give consent to the collection and use of such information. Given the relationship between privacy, access and confidentiality, and given the fact that the protection of any right is through duties, or obligations, ethical as well as legal, the protection of the right to privacy is through a set of obligations which ensure that information can only be collected and used with the consent of the person to whom the information pertains, or belongs. As a general rule, then, to collect, to obtain, or to use information about a person without his or her consent, is to violate that person's right to privacy, and again as a general rule, to violate someone's right is to

fail to respect that person. However, there are circumstances in which consent is not necessary, as implied by Figure 1.

Figure 1 shows that a person may allow a certain degree of accessibility by others so as to enhance the value of his or her privacy. We need to allow others access if the society is to function to our advantage. For instance, service providers need to gain access to provide services. It would be too cumbersome to seek consent every time access is required. In the medical context, patients' medical record may be accessed in the course of their treatment. Thus, in many situations, we accept that consent is either not necessary, or can be taken as having been implicitly given. In the case of informational access, certain kinds of information may be collected or used in certain ways without explicit consent, and the collection or use of such information in such ways does not constitute a breach of confidentiality, or a violation of the right to privacy. The trader who keeps a list of names and contact details of clients does not violate their right to privacy even if they are not aware of it (which does not mean that such details cannot be used in ways that do constitute invasion of privacy). Indeed, in certain situations, such as when there is a need to ensure security in a place of work, personal information may have to be publicly displayed. The Rawlsian justification of the right to privacy and confidentiality allows for, indeed requires, trade-offs to be made. Thus, the right to privacy is the right to that particular level of privacy that yields the most value. Likewise, not everything that is personal has to be confidential: the level of confidentiality has to be calibrated to yield the most value. To be sure, as noted earlier, legislation may be necessary in certain situations to clarify the legal obligations of confidentiality and the need to obtain consent.

One clear implication of the argument above is that consent is not necessary when personal information enters the public domain. Since the obligation to seek consent derives from the right to privacy, if privacy is not affected, the need to seek consent does not arise. Also, there are situations in which personal information, once consented to be used, becomes depersonalized and hence non-confidential. In these situations, information may be used, or re-used, for any good reason without seeking

consent. For instance, biomedical data, which have been collected for a specific research project with the consent of the participants and have been anonymized, may be re-used for another research project without the need for another consent. It may be said that since the source of the information is still the research participants who gave the original consent, any further use of the information, even if depersonalized, amounts to exploitation. However, writing in the *British Medical Journal*, Mary Warnock (Warnock 1998: 1002) dismisses this concern, arguing that it is an "exaggeration" to refer to the use of "anonymous data, collected for a particular study, [for] a further, previously unthought of, study" as "exploitation."

2.3 Balancing Rights

We have seen that in considering what is private, there is already a balancing between privacy and access, as Figure 1 shows. The need for balance also exists from the community's point of view. Just as an individual finds that he or she will benefit most by allowing a balance of privacy and accessibility, the community will function best by balancing the need to respect members' right to privacy with the need to gain access to them. Indeed, the latter can be elevated to the level of a right, the community's right of access, if we argue along the Rawlsian line that it would be what we would, in the "original" position, grant to the community. Such right of access should be thought of as an individual's right to be exercised through the community, rather than something over and above individuals, insofar as it is necessary for the protection of the health, welfare and security of individual members of the community. For instance, personal information, including medical record, may be made available to the authorities without consent to control communicable diseases, or to protect by-standers from bodily harm.

It may be asked whether the logic of the Rawlsian argument extends beyond the protection of the health, welfare and security of all members of the community to the *enhancement* thereof. If it were extended in this way then, in the case of biomedical research, personal information could be obtained and used without consent in research that would yield health benefits to the community as a whole. Unfortunately, such extension of the Rawlsian argument cannot be justified. For one thing, balancing rights

in this way sets the community on a dangerous slippery slope towards curtailing the right to privacy for minor benefits. For another, the Rawlsian argument, as typical of an argument for rights, is aimed that the protection of the individual against others and the state. As such, it does not apply to cases where the individual's interest is not directly at stake, as compared with cases where the health, welfare and security of members of the community are at risk and need to be protected. It is not directly at stake in the enhancement cases, even though there is a chance that certain individuals will benefit from such enhancement.

The conclusion so far is that given the right to privacy, personal information may not be collected and used without consent, unless for the protection of the health, welfare and security of all members of the community. Against this conclusion, it may be said that when members of the community are reluctant to give consent, or more generally to participate in biomedical research, substantial benefits that such research can yield will be foregone. It may be said that it is unreasonable for the community to forgo substantial benefits, and so we need to balance the value of consent against the benefits of the research conducted without it. However, such view undermines the value of privacy noted above. More importantly, it assumes that we, as individuals, do not take into account community benefits when we balance privacy against access to determine the value of privacy as shown in Figure 1. It may be that members of the public will be much more willing to give consent to personal information being collected and used in research, or to become research participants, if they are informed about the benefits of research. In any case, it is possible to convince ourselves that we should take community benefits into account when we decide how much privacy we should have, or whether we should participate in biomedical research. There are a number of ways of doing so, which will be explored in what follows.

3. Right to Privacy versus Obligations to Community

It has been argued that since we are now the beneficiaries of past research efforts, which would not have been successful without the participation of members of the public who volunteered to be research participants, we have the duty to reciprocate by

volunteering to be research participants, or at least consenting to our personal information being collected and used in research. In order to discharge this duty, we will have to be less concerned about the right to privacy, or more willing to allow access to us. In terms of Figure 1, our privacy value curves will have to skew a little more to the left. However, Hans Jonas (Jonas 1991) has rejected this line of reasoning. Jonas argues that being beneficiaries of past research, if we owe past participants anything, it is a debt of gratitude, not an obligation to participate in current research. Past participation was voluntary and past participants may be praised for having been altruistic, but this does not impose an obligation on us. On the other hand, making participation into a duty of reciprocating could well put an unfair moral and social pressure on the current generation.

Jonas' dismissal of the duty to reciprocate is rather too quick. To begin with, to acknowledge that we do *owe* a debt of gratitude is already to acknowledge that we are under some kind of an obligation, that there is something we *ought* to do. (It is interesting to note that in Old English, "ought" is the past tense of "to owe.") It is true that what we ought to do to discharge a debt of gratitude is not necessarily to repay in kind (to become research participants ourselves). However, this is true, arguably, only when the relationship between the giver and the receiver is asymmetrical, such as between the rich and the poor, where the receiver (the poor) is in no position to repay in kind. When the relationship is symmetrical, we typically expect the debt to be repaid in kind. Naturally, it is open to Jonas to insist that we owe nothing to past participants. In any case, there is nothing we can do now to benefit past participants in return, and we certainly do not owe any debt to future generations (for the scientific benefits we now enjoy). The case for reciprocity in biomedical research remains to be established.

According to Knoppers and Chadwick (Knoppers and Chadwick 2005), in the last decade of the twentieth century, new trends have emerged in the ethical debate surrounding human genetic research. These authors claim that there has been a "move away from autonomy as the ultimate arbiter" in bioethical debates towards the ideas of "reciprocity," "mutuality," "solidarity," "citizenry" and "universality" (Knoppers and

Chadwick 2005: 75 & *passim*). If they are right, a new context may well be emerging in which there is a greater acceptance of the idea that the right to privacy needs to be balanced against the duty of making ourselves more accessible for research purposes. However, trends cannot be accepted just because they are trends: they will have to be justified. Knoppers and Chadwick do not offer any justification for the ethical trends they observe. More importantly, any "move away from autonomy" is inherently dangerous. What we need to do is to reconfigure the idea of autonomy, taking it out of its traditional individualistic context and put it in a communitarian context.

In the Western philosophical tradition, the idea of autonomy goes hand in hand with the idea of a person as an individual independent of and apart from the society, who chooses to live in the society, accepting social restrictions and assuming social responsibilities so as to further the individual's own interests. Hobbes' justification of obedience to social rules and Rousseau's notion of the social contract are based on such conception of a person. As we have seen, the idea of "rights" is typically understood as individual rights, posited to protect the individual from the undue intrusions into the individual's life by the society and by other individuals in the society. Even Rawls' communitarian theory of justice presupposes this conception of a person. Given this conception, reciprocity is at best a virtue, like gratitude, or humanity. It is difficult to elevate it to the level of a duty, or obligation. However, a different conception of a person has existed just as long as that found in thinkers such as Hobbes and Rousseau. It is the dominant conception in the East, particularly in Confucianism, though not entirely unknown in the West (Nuyen 2006).

According to Julia Ching (Ching 1998: 72), "the Chinese view of the human being tends to see the person in the context of a social network rather than as an individual." For Roger Ames (Ames 1993: 151), Confucianism takes a person as "a social product, defined not as some essential locus of potential or rights claims but in the pattern and roles of social discourse" and thus "the Confucian notion of personal realization is irreducibly social." In the Confucian tradition, a person is constituted of the social relationships in which he or she stands. Social relationships, in turn, are

characterized by social positions, or roles. More importantly, social positions are defined in terms of obligations, or duties. To each position is attached a set of obligations, and to be in a position is to be under a set of obligations. Given this conception of a person, various duties are built into the being of each individual person. It is not difficult to argue that among such duties is the duty to reciprocate. Thus, it may be said that science is just one the networks of social relationships, binding scientists, researchers and all other members of the society, each having a role to play. If science is seen as a social, or collective, activity then the role of an ordinary member of the society is to assist in the advancement of science, either by volunteering to become a research subject, or to allow personal information to be used in research. Given this understanding of what it is to be a person, the notion of a duty to participate in research does not put undue social or moral pressure on a person as Jonas claims, because to be a person just is to be under such pressure. Neither does it represent a "move away from autonomy" because it takes an autonomous person to recognize the duties and obligations that constitute himself or herself as a person and to act accordingly.

To be sure, this way of understanding persons and society also puts pressure on scientists and researchers, who accordingly are not individual persons independent of society, pursuing their scientific goals with the help of other members of the society: rather, they occupy specific positions in the scientific node of the network of social relationships, pursuing common scientific goals *together with* other members of the society. As such, there are specific duties and obligations, which dictate the kinds of research that may be pursued, and the manner in which the research is conducted. In relation to the latter, we can specifically stipulate the duty to respect the right to privacy, which entails obligations to seek consent, to treat personal information with confidentiality and so on. Just because a person is understood in terms of a network of social relationships, it does not follow that privacy is no longer, or less, relevant. If anything, it is even more relevant insofar as, as argued above, privacy is necessary in forming and maintaining social relationships.

By way of conclusion, it may be observed that, in identifying new trends in the bioethical debate, Knoppers and Chadwick come from the scientific side, attributing the new trends to the nature of contemporary biomedical science. Thus, they note that biomedical scientists can no longer confine their research to homogeneous or isolated populations, but have to study heterogeneous populations; that a great deal of research findings affect not specific individuals but genetically related groups; that there are common human vulnerabilities requiring the pooling of research data into data bases; that collective identity is often implicated in biomedical research and that ultimately the human genome is shared by all and all should have an interest in research on it. Knoppers and Chadwick seem to imply that the nature of modern biomedical science necessitates new ways of thinking in biomedical ethics. However, whether these new ways signal a "move away from autonomy" is debatable. What is true is that modern biomedical science can no longer be conducted in the a conceptual framework in which a person is understood as an individual independent of others, and a society is a collection of such individuals, the latter existing for the sole purpose of furthering the interests of individuals. Arguably, a conceptual framework in which persons and society define each other is much more congenial to modern biological science. This conceptual framework puts a premium on the value of privacy, allowing its role in forming and fostering social relationships to come to the fore, and thus secures the right to privacy and through it the respect for personal autonomy. At the same time, it highlights the fact that the value of privacy, for the individual as well as for the society, is a balance between distance and accessibility vis-à-vis others, that confidentiality is a balance between privacy and communal interests, and that respect for personal autonomy is respect for a person, scientist, researcher or otherwise, as an individual standing in a network of social relationships, which encompass all the sciences, especially the new biomedical science, given its nature.

REFERENCES

Ames, R.T. (1993). "On Body as Ritual Practice," in Thomas P. Kasulis (ed.), *Self as Body in Asian Theory and Practice.* (Albany: SUNY Press): 149-156.

Ching, J. (1998). "Human Rights: A Valid Chinese Concept?" in W.Theodore de Bary and Tu Weiming (eds.), *Confucianism and Human Rights.* (New York: Columbia University Press): 67-82.

Gavison, R. (1995). "Privacy and the Limits of Laws," in Deborah G. Johnson and Helen Nissenbaum (eds.), *Computers, Ethics and Social Values.* (Englewood Cliffs, New Jersey: Prentice-Hall): 332-351.

Jonas, H. (1991). "Philosophical Reflections on Experimenting with Human Subjects," in Thomas A. Mappes and Jane S. Zembaty, *Biomedical Ethics.* (New York: McGraw-Hill): 215-219.

Knoppers, B.M. and R. Chadwick (2005). "Human Genetic Research: Emerging Trends in Ethics." *Nature Review Genetics*: Vol.6, January: 75-79.

Nuyen, A.T. (2006). "The Self and Its Virtues: Is There a Chinese-Western Contrast?" in Kim-Chong Chong and Yuli Liu (eds), *Conception of Virtues East and West.* (Singapore: Marshall-Cavendish): 237-254.

Rachels, J. (1975). "Why Privacy Is Important." *Philosophy and Public Affairs*: Vol.4: 323-333.

Rawls, J. (1971). *A Theory of Justice.* London: Oxford University Press.

Thomson, J.J. (1975). "The Right to Privacy." *Philosophy and Public Affairs*: Vol.4: 295-314.

Warnock, M. (1998). "Informed Consent: A Publisher's Duty." *British Medical Journal:* Vol316: 1002-1003.

ENSURING DATA PRIVACY IN BIOMEDICAL RESEARCH INVOLVING RECORD LINKAGES

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INTRODUCTION

Sources of personal information for biomedical research

1. There are many possible sources of personal information that can be used for biomedical research. These could range from information obtained through interviewing or testing a research subject or a patient, information submitted to a database or registry and information derived from tissues obtained from the research subject or patient. Broadly, we can consider all such information to be obtained in a research or non-research (usually clinical) context.
2. Within a research context, the collection of such data and tissues is subject to approval and review by ethical review committees and/or prevailing legislation/regulations. Informed consent is the accepted requirement for such collection.
3. The doctor-patient consultation is another major context where collated personal medical information could be used for biomedical research. Although obtaining informed consent is the preferred model, the research questions may not be apparent during the clinical consultation process. To return to the patient for informed consent may not be logistically practicable or be in the best interests of the patient.
4. Finally, data that is routinely collected or submitted to registries, public and private agencies may be of immense value for biomedical research. For example, data on death and emigration status is vital for follow-up studies. The disclosure

of such personal information is usually governed by existing national legislations or organizational regulations.

5. Such data is usually stored in the form of electronic records in databases managed by healthcare institutions, government and non-governmental registries as well as researchers. For the purpose of biomedical research, it may be necessary to link the records of individuals from multiple databases.

Value of record linkages

6. In 1994, Professor David Barker gave the Wellcome Foundation Lecture at the Royal Society of London titled 'The fetal origins of adult disease'. His hypothesis was that the nutritional status of the embryo may program the developing fetus towards a higher risk of adult diseases like coronary heart disease, diabetes mellitus, stroke and hypertension. One of his earlier works was to trace the birth weights of 15,726 men and women born in Hertfordshire between 1911 and 1930 and their subsequent deaths from coronary heart disease till 1980s. Those with birth weights of less than 5.5 pounds and those who weighed less than 17 pounds at one year of age had the highest risk of coronary heart disease in adult life. Such findings were subsequently confirmed in several other countries.
7. The idea that adult health may reflect circumstances in childhood, or even earlier in life, is one that dates back many years. However, David Barker's group in the UK wondered if the effect of intrauterine programming extended to adult life. This simple but novel extrapolation of birth weight to subsequent coronary heart disease is commonly called "Barker's hypothesis". It generated much interest and controversy, with editorial comments ranging from the enthusiastic to the critical.
8. In much the same way, linking databases of patients suffering from a particular disease with the death registry helps doctors and medical researchers understand the natural history of diseases, identify prognostic factors as well as evaluate treatment strategies. At the national level, such linkages provide data for the evaluation of health care services and formulation of health care policies.

9. Although there is tremendous research and public health value in linking an individual's personal information, there is a need to respect and protect the privacy of the individual. In nearly all instances, researchers using the final dataset for analysis do not need to have the identity of specific individuals. The identity of the individual is only needed during record linkages and if the subjects need to be re-contacted. It is possible to develop systems that enable record linkages and re-contact, and at the same time protect the identity of individual subjects. Generally, such systems involve some degree of de-identification of the data collected from the subjects.

DE-IDENTIFICATION OF BIOMEDICAL RESEARCH DATA

Data that identifies an individual

10. Personal information about an individual with potential for research use can be divided into two groups:
    a. Personal identity data
    b. Research data
11. Personal identity data consists of data items that, singly or in combination, could potentially identify a specific individual. For example a person's name and unique personal identification number, which in Singapore is the National Registration Identity Card (NRIC) number, are considered personal identity data. Some would add ethnicity, date and place of birth, and gender. In rare situations, simple combinations like date of birth and diagnosis of an extremely rare condition may potentially reveal the identity of an individual. In other words, in rare situations, it may be possible to identify a specific individual from the research data. However, it is not necessary to invest vast resources to build a system that claims to be 'fail-safe' for such cases. Any system must balance the public interest against the protection of individuals, so that disproportionate costs are not involved in setting up and using a system that will not benefit or be relevant to the vast majority of cases. Systems must ultimately rest on positive

assumptions that the majority of users will want to honour the privacy and autonomy of their subjects, while putting in place a strong set of safeguards against potential misuse.

Terminologies

12. De-identification of biomedical research data can be defined as a process whereby personal identity data is separated from the research data. There have been many different terminologies for the concept of de-identification, such as anonymisation, pseudo-anonymisation, partial de-identification, etc.
13. Conceptually, it will be easier to have three levels of de-identification:
    a. Completely identifiable data: Personal identity data and research data are stored as single electronic or paper records. The data items may be coded or reversibly encrypted for confidentiality, but the personal identity and research data are physically linked within a single data table.
    b. Reversibly de-identified data: Personal identity data are separated from the research data. Each record in the research data is identified by a unique identifier such as a 'private unique identification number' (PUIN) which does not carry any personal identity information. The corresponding personal identity data is also identified by the PUIN which thus serves as a bridge between the two databases.
    c. Completely de-identified data: Personal identity and research data are de-linked in such a way that it is impossible to reconnect them and identify any individual from the research data.

De-identification in follow-up studies

14. The main characteristic of a follow-up or cohort study is the collection of data on predictive factors prior to the awaited outcome. In the famous Framingham study, subjects were recruited and information gathered on dietary and lifestyle factors as well as blood collected for measurement of cholesterol levels in individuals without heart disease. These subjects were followed-up for decades

during which, some of them developed coronary heart disease. Clinical trials follow the same design. A cohort of breast cancer patients is recruited and data on prognostic factors collected. These patients are randomly assigned to different treatment regimes and closely monitored for the outcomes of interest like recurrence, metastasis and death.

15. To maximize the value of data and tissues collected in such follow-up studies, the data should be managed as reversible de-identified data. Data managers should have in place a system for reversing the de-identification as new data on the same individual is obtained subsequent to the initial recruitment. However, the final datasets and samples sent to researchers should be completely de-identified.
16. A system for handling such reversible de-identified data should have the following characteristics:
    a. A trusted third party (TTP) with appropriate governance structure that holds the link between PUIN-personal identity data and
    b. A mechanism whereby the ground operations is partitioned such that no one is able to have all three sets of information: PUIN, personal identity data and research data.
    c. A mechanism of record linkage with external agencies such that they do not need to release completely identifiable data.

DE-IDENTIFICATION SYSTEM IN THE SINGAPORE CONSORTIUM OF COHORT STUDIES

The Singapore Consortium of Cohort Studies (SCCS)

17. The SCCS can serve as a specific illustration of the implementation of a system for maintaining privacy while allowing the collection and use of data from more than one source. The SCCS is an ambitious follow-up study by the National University of Singapore in collaboration with researchers from both healthcare clusters and A*STAR research institutes. The aim is to study how genetic and lifestyle factors influence each other in the risk of developing diseases of public health importance. It will establish two cohorts:

a. A multiethnic cohort of 250,000 normal healthy subjects for the study of their subsequent susceptibility to diseases like coronary heart disease, stroke and common cancers;
b. A multiethnic diabetic cohort of 25,000 type II diabetics for the study of diabetic complications.

18. The subjects and patients will be recruited with full informed consent and the entire project will be monitored by Institutional Review Boards. The Biomedical Research Council has provided initial funding for a 5-year pilot project.
19. In such cohorts, data on both genetic and lifestyle factors is needed. Genetic data of interest (germline mutations) will not change with the onset of disease. However, lifestyle factors change significantly and may affect recall of past lifestyle habits. Hence, data on lifestyle must be collected prior to the onset of disease. Furthermore, blood specimens will have biomarkers that could be used to estimate exposure factors.
20. Many countries around the world, are establishing such cohorts. The UK Biobank, for example, aims to recruit 500,000 subjects and 'will be a unique resource for ethical research into genetic and environmental factors that impact on human health and disease, to improve the health of future generations.' Similar efforts are seen in Sweden, US, China, Malaysia, South Korea and Japan. Unlike most of these countries, Singapore will provide a multi-ethnic cohort that has undergone rapid economic development resulting in dramatic changes in lifestyle factors. This combination of multi-ethnicity and rapid change is a powerful setting for discovering significant gene-environment interactions.

Maintaining data privacy in the SCCS

21. Recruitment of subjects for the cohort of normal healthy individuals will be done by field workers in the community setting. The field worker will therefore have the personal identity data and the questionnaire data. Each subject will also be identified at this stage using a unique study number (SN). The personal identity data and the questionnaire data will be coded, encrypted and kept in separate databases in the interviewer's computer. At the end of each working day, the

databases are uploaded to the servers and the data in the interviewer's computer erased permanently. The questionnaire data will be sent to the research database while the personal identity data is sent to a separate database (Figure 1).

22. The research database (without the personal identity data) will be managed by SCCS staff from the NUS. The personal identity database will be managed by a Data Privacy Framework (DPF) Office under A*STAR. The DPF Office functions as the TTP and creates and maintains the unique PUIN. When the DPF Office receives the personal identity of a subject from the field workers, a PUIN is generated (if the subject has not been previously recruited) or the existing PUIN is retrieved.
23. When the SCCS Office receives the research data from the field worker, it will send the SN to the DPF Office, which will return the PUIN. The research data in the SCCS database are now tagged with this PUIN.
24. The subject is invited to a clinic for examination and donation of blood specimen. At the clinic, the NRIC is sent to the DPF Office which returns the original study number (SN). This study number will be used to track all the clinical data and specimens collected at the clinic. The clinical data is uploaded to the SCCS server directly. This clinical data is linked to the questionnaire data using the SN. The specimen is sent to the Singapore Tissue Network (STN) which is a nation-wide repository of biological specimens for research purposes (figure 2).
25. When the STN receives the samples, the SN will again be sent to the DPF Office which in turn will return the PUIN. Samples in STN will then subsequently be identified using the PUIN (figure 3).
26. In this system, the SCCS maintains an effective partition between different operations. No one will be in possession of all three sets of information: PUIN, personal identity data and research data.

Maintaining data privacy in electronic record linkages with external agencies

27. Over the years of follow-up, the SCCS subjects will be revisited for additional information. However, it may not be desirable to obtain information on the occurrence of certain outcomes (e.g. cancers and deaths) directly from the

subjects or their relatives. With electronic capture of such occurrences, it is possible to perform electronic record linkages with the respective registries.

28. For example, if a researcher needs information on episodes of coronary heart disease and death from coronary heart disease among the diabetics in the cohort, it is possible to obtain such information through electronic record linkages with both the Singapore Myocardial Infarction Registry (SMIR) and the Registry of Births and Death (RBD). However, a system must be in place to ensure that the privacy of the individual subjects is protected.
29. Following approval by the IRB for electronic record linkages with RBD and SMIR, the SCCS sends a listing of PUIN of all diabetics to the DPF Office. The DPF Office retrieves the NRIC of these subjects and creates a new number that is used only once (Nonce: number used only once). The DPF Office sends to SMIR and RDB the NRIC-Nonce listing. At the same time, DPF Office will also send to SCCS the PUIN-Nonce listing. The DPF Office will only hold the PUIN-NRIC-Nonce listing for a short duration. The RBD and SMIR will match the NRIC with their databases, identify the subjects with coronary heart disease, extract the necessary data items, and then remove the NRIC. Each individual with a coronary heart disease event will now be identified by the Nonce. The RBD and SMIR will send the listing of Nonce with the necessary additional data to SCCS. The SCCS can now link the new data on coronary heat disease to the diabetics using the Nonce. The necessary dataset can then be sent to the researcher without the PUIN.
30. This system will allow electronic record linkages with external agencies without revealing the identity of the subjects. Furthermore, the PUIN need not be sent to external agencies or researchers. The DPF Office will also not receive new data which has the potential for identifying individuals. New data will be sent to the SCCS without the personal identity data.
31. The entire operations of the DPF Office will be computerized and require minimal human intervention. The creation of Nonce, sending of listings to various bodies could be done automatically. The governance of the DPF Office

can be further strengthened by an independent Oversight Committee that will approve requests for electronic linkages as well as audit the operations.

CONCLUSION

32. There is tremendous research and public health value in linking an individual's personal information from various sources. In nearly all instances, researchers using the final dataset for analysis do not need to have the identity of specific individuals.

33. The model proposed here, though complex is a careful marriage of efficiency and privacy. It is easy to go overboard one way, at the expense of the other, so international best practices have been carefully studied, along with conditions and settings peculiar to the Singapore biomedical research scene. The model provides an example of what can be done to enable important research that will provide great benefit in terms of helping prevent diseases and their complications by identifying risk factors.

Figure 1: SCCS operations – fieldwork

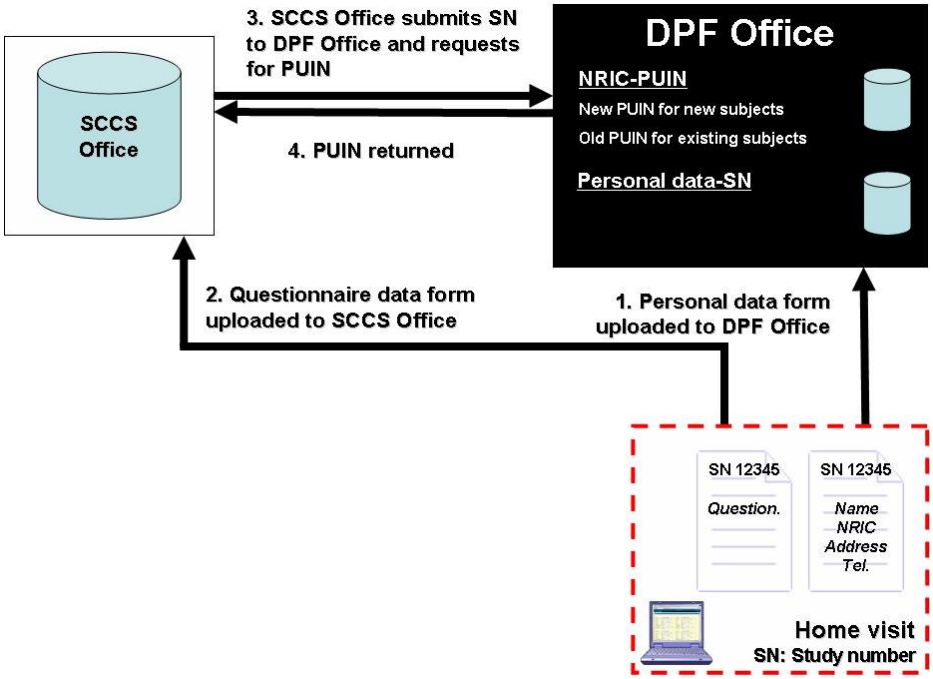


Figure 2: SCCS operations – clinic visit

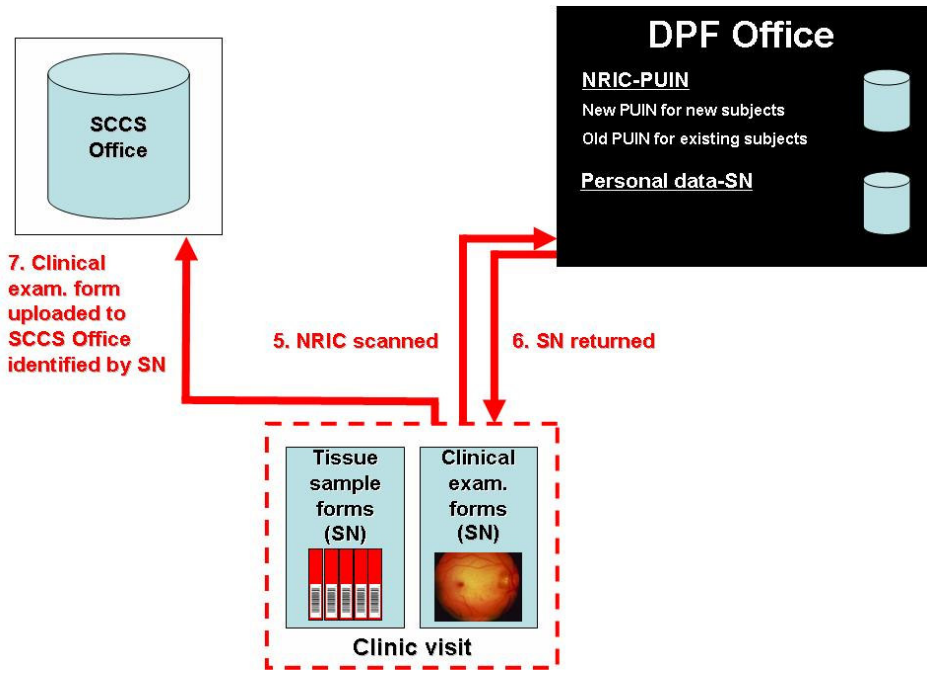


Figure 3: SCCS operations – STN

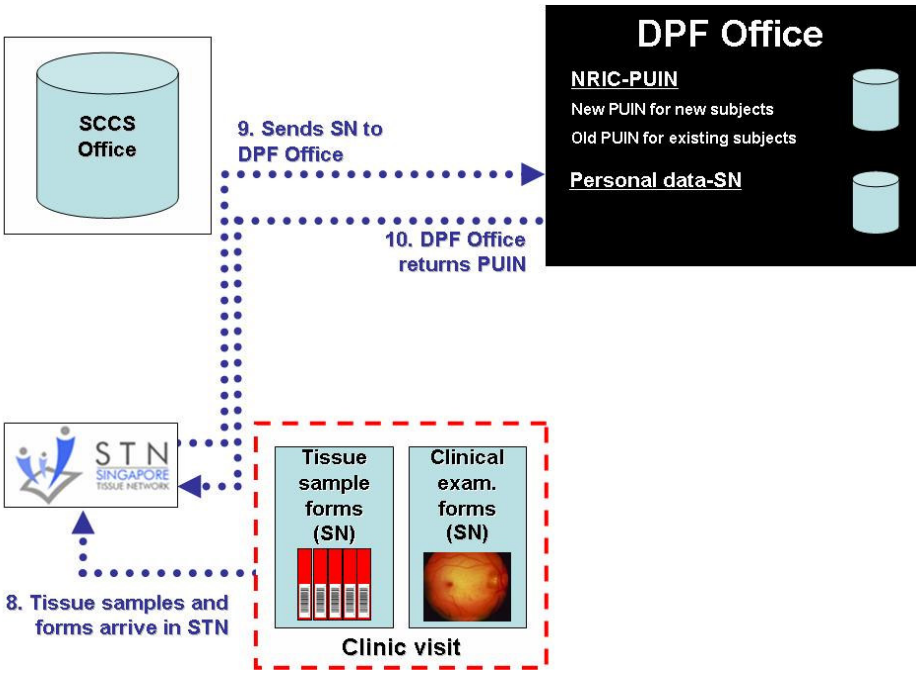
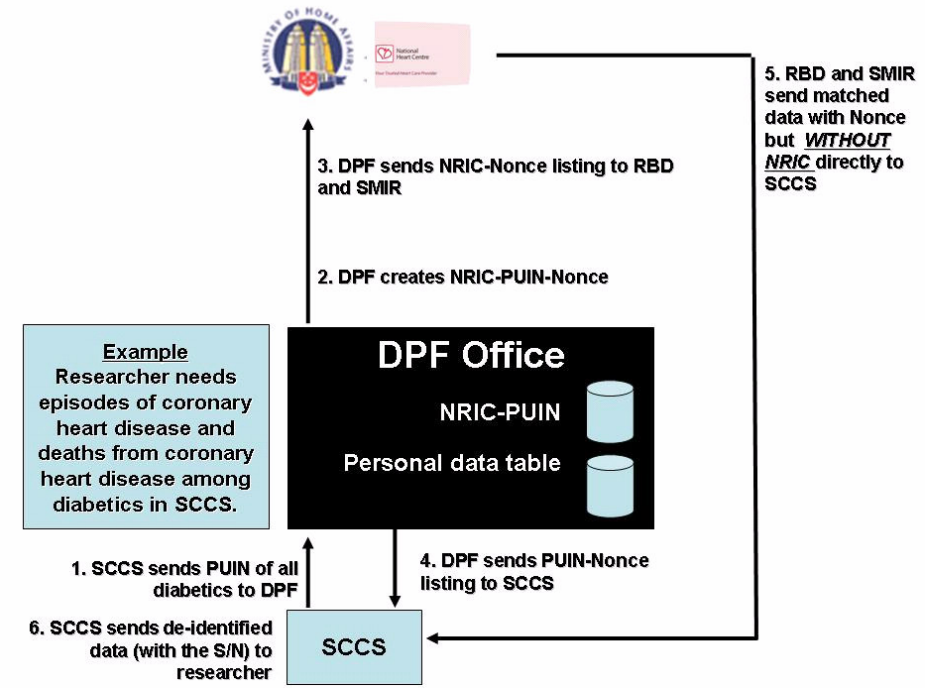


Figure 4: SCCS operations – electronic record linkages



THE IMPORTANCE OF RESEARCH USING PERSONAL INFORMATION FOR SCIENTIFIC DISCOVERY AND THE REDUCTION OF THE BURDEN OF DISEASE

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In what will be its fifth consultation paper, the Bioethics Advisory Committee (BAC) will present its deliberation on the issues arising from the use of personal information in biomedical research. It is within this broad framework that I shall provide a perspective as both a practitioner of medicine and a scientific investigator.

Fundamentally, public interest in safeguarding privacy of personal information must be properly balanced with public interest in enabling biomedical research in ways that will advance the nation's health. It presents an important principle of "reciprocity": the notion that accepting benefit from past medical research, inherent in the use of medical services, carries some expectation of a willingness to participate in future research for the common good.

Undoubtedly, the BAC will propose recommendations as an endeavor to attain this balance, but my main concern is with the way in which these recommendations will be implemented. As with all processes that require judgment, implementation without an understanding of the operational complexities will often arrive at too simplistic decisions with negative consequences. Thus, this paper is prepared with a view to the future, and is directed at two concerns relating to the execution phase downstream.

The first concern is an emphasis on the division between clinical care and medical research. The distinction between continuous improvement of medical practice and academic research is fast disappearing. Both activities can be called investigative medicine in which systematic analysis and ultimately the publication of the results is expected. During the SARS crisis some sectors of the medical community sought to compartmentalize and separate clinical care and research. The argument was that at a time of crisis, we should not be wasting resource on academic questions. However, we quickly learned that when confronted with an unknown pathogen paralyzing the country, a research strategy was critically needed to uncover the root cause of the epidemic and to structure a science-based response. Moreover, publishing the results of our findings in academic journals not only disseminated the results globally, but also brought international prestige that included investor confidence so important to stabilize the economy. A great fear would be that, in the attempt to safeguard the privacy interest of individuals, a boundary will be drawn makes artificial distinctions between clinical practice improvement and research. I am concerned that differential restrictions would be placed on one or the other under a misguided view that clinical practice is for the common good whereas biomedical research is not.

Biomedical research is conducted to benefit patients with disease and improve public health in general. Virtually every medical procedure today is the result of some form of clinical investigation. A simple example was the practicing physicians who noticed that in their medical practice, young men were hospitalised with undiagnosed fatal respiratory infections. They examined the medical records and found them to be all gay men. It was this simple form of physician effort that brought the world's attention to a new syndrome of Acquired Immunodeficiency Syndrome or AIDS.

Clinical studies test whether new approaches are better than old approaches. For over 60 years until the 1970s, the only treatment for breast cancer was the removal of the entire breast along with the overlying skin, the underlying muscles and all lymph nodes in the arm pit. It was a disfiguring operation that always resulted in swollen arms with limited mobility. Surgeons were sure this surgery was necessary to remove all possible deposits of cancer. Then, an academic surgeon, Bernie Fischer, challenged this dogma by conducting a large clinical trial to test whether less radical surgery would yield the same results as the drastic operation. This study involved patient volunteers. When it was first launched, he was criticized by the established surgical community for doing unethical experiments on cancer patients because many surgeons were sure that without extensive surgery, more cancers would return. Instead, Fischer's study conclusively showed that the less extensive surgery was just as good in treating the cancer as the disfiguring procedure and had far fewer long term complications. This study and others dramatically changed the entire way we treat breast cancer.

One branch of medicine (epidemiology) deals with the study of the causes, distribution, and control of disease in whole populations. Population research with volunteers has contributed significantly to how we manage common diseases. The Framingham Study in the United States started in 1948 followed 5,209 healthy volunteer subjects for 50 years to assess who would get heart disease and who would be spared. At the start of the study, everyone answered questions about their life style and gave blood for analysis. At the end of the study, the blood tests were correlated with the development of heart attacks. This study was one of the first to show that high cholesterol was a major risk factor for heart attack and led to the use of cholesterol lowering drugs to prevent cardiovascular disease. These drugs, in turn, all underwent clinical trials on patient volunteers to prove that they were effective in reducing cardiovascular events and had no serious side effects. Other conclusions from the Framingham Study were that smoking increased cardiovascular risk, and that specific forms of cholesterol were protective of heart disease. Every outcome from this academic research project became the basis for current medical practice in cardiovascular health.

Likewise, even Chinese herbal medicine today is the result of four thousand years of careful and systematic observation and experimentation. The professional knowledge of the individual practitioner is not simply reading a medical textbook but active observation, systematic note-taking, and even giving patients a new mixture of herbs never tried before. So accessing patient information is the first form of medical investigation, and one that is essential for doctors to adjust to new diseases and potentially new treatments.

How should the regulations and legislation be constructed? There should be only one set of guidelines for all forms of investigative medicine whether it is for the Ministry of Defence (MINDEF), Ministry of Health (MOH), A-STAR, or for University research. Moreover, investigations from one sector should not be cordoned off from the other: e.g., University researchers should not be prohibited from using data acquired through an MOH public health project. The issues of proportionality and the caveats of community sensitivity over research questions enunciated in bioethical literature sufficiently cover most, if not all, contingencies. Singapore is simply too small to have such silos of investigative medicine. There is not enough expertise to exclusively service single silos. Even in more developed jurisdictions, the best research that leads to major public health changes comes from deep collaborations across academic – government lines.

The second concern is that the distinctions between de-identification and anonymization (both are means to safeguard privacy) will be confused. De-identification is a process whereby information about a patient such as exposure to environmental agents, age, height, race, disease, and disease outcome is separated from information that can identify the individual (e.g., NRIC number, name, address – collectively called patient identifiers). Researchers can work with this information and derive important results. The key distinction is whether this dataset of an individual patient can ever be linked back to his identifying information? If such a link is destroyed and identifying the dataset is impossible, then the data is said to be anonymized. In some cases, that key that links that clinical data to the patient identifier is important. For example, if one wishes to understand how a single blood test could predict outcome ten years later (as the case of the Framingham Study), then such a link is an absolute necessity. Unreasonable demands that keep critical databases from interacting will severely limit the benefit of such research to the public. Luckily, current information technologies have encryption solutions to resolve these problems. Systems are available for a "trusted third party" to hold the key to linking personal identifiers with the personal information such that individual investigators can intermittently update their information without ever being able to access the personal identifiers (Figure 1). Such information security systems have already been in place and are highly functional. All of e-commerce and e-banking is completely based of the trust of the customers that important personal financial information is kept confidential, yet linked.

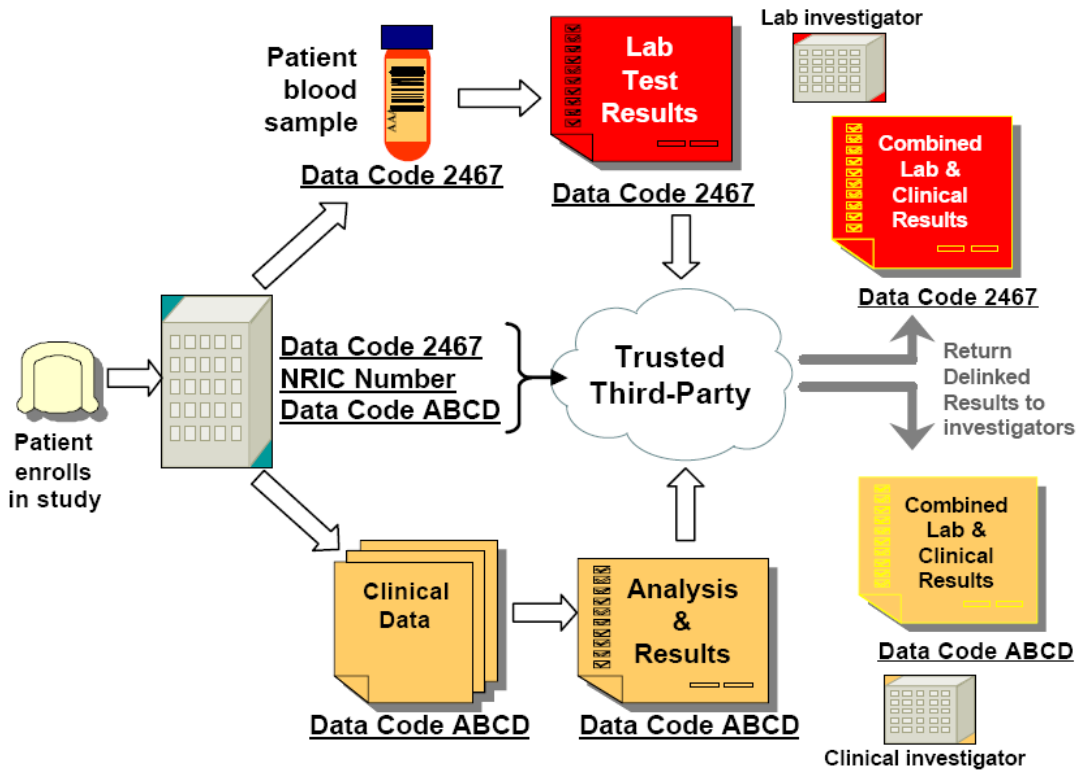

Figure 1. Flow of de-identified information using a Trusted Third Party framework

This discussion has far reaching importance. If proper structures for ethical access of information are in place, we can accelerate discoveries that can make a difference in the delivery of care, improve Singaporean public health, and create new knowledge valuable globally. Whereas a patient's participation in a clinical study may last only a few months, the value of his medical information increases with time. Thus, any requirement for fully rendering data anonymous, which forever cannot be linked to an individual's identifier, should be considered with great deliberation. This is because the effort and cost in assembling the patient study and its analysis will be also forever lost.

In Singapore, we are embarking on a new way of conducting research and conceptualizing how we can reap the benefits of this research. Our great strength and advantage in this globalize world is our ability to integrate processes, institutions, and actions that leverages on our small size and high social trust. The proper execution of privacy safeguards in the use of personal information in biomedical research will bring dividends in better and more cost effective health care and put Singapore in the forefront of medical investigations.

GENETICS AND LIFE INSURANCE

A position paper by the Life Insurance Association, Singapore

1 Introduction

1.1 Research and developments in the field of human genetic science will have profound consequences. Not least, it raises concerns for the use of and access to genetic information. In particular, there are perceptions that genetic testing will be seized upon by insurers as a powerful tool to identify those with a favourable genetic profile. Put the other way around, it is assumed that insurers will seek to exclude those whose genetic makeup has some abnormality, thereby creating a 'genetic underclass'.

1.2 These concerns are based more on speculation than upon fact but, nonetheless, the Association acknowledges that these concerns need to be addressed.

1.3 In reality, there is little reason to suppose that the proportion of the population that can be accepted for insurance will suffer as a result of advances in genetic science. Historic evidence shows that advances in medical knowledge have consistently contributed to improvements in mortality and a broadening of access to insurance. Certainly, insurers have no interest in narrowing the market for their products. On the contrary, they have every reason to welcome advances that improve the effectiveness of health management and make life insurance more affordable for all.

1.4 We believe that it is far more likely that a better understanding of the interaction between genetic makeup and environmental influences will have a positive impact on management and treatment which will result in further improvements in mortality.

1.5 If one accepts that premise, there is a clear coincidence of interest between life insurers and society as a whole in the successful development of genetic technology.

1.6 Section 3 of this paper sets out the industry's position on the question of access to genetic information. However, in order to put these views in context, we first explain the philosophy that underpins life insurance pricing. Section 4 explains the statistical basis of life insurance pricing and indicates how medical evidence

is used in the pricing process. Section 5 gives a brief international perspective and the overall conclusions are set out in Section 6.

2 Basic Philosophy of Risk Classification in Life Insurance

2.1 The foundations of life insurance pricing are rooted in the pooling of broadly homogeneous risks. The aim is to achieve broad equity between the premiums paid and the risk borne by the pool.

2.2 In theory it would be quite possible to grant universal access to insurance and charge common premiums regardless of the heterogeneity of the risks being borne. However, in practice, such a system would only work where there is compulsion to participate or where individuals remain in ignorance of the cross-subsidies involved. Otherwise, there would be the risk of spiralling costs as those with the greatest expectation of claim would have a greater incentive to buy whilst the younger and healthier members of the population would turn their backs on insurance.

2.3 The fact that purchasing decisions in a voluntary system of insurance are not random makes some form of screening a necessity. Thus distinguishing between, as distinct from discriminating against, applicants is a fundamental and necessary part of the pricing process.

2.4 In Singapore (in common with many of the established insurance markets around the world) the principal criteria for risk classification are age, gender and smoker status. The vast majority of applicants – probably around 95% - will be accepted on terms which are 'standard' for their age, gender and smoking status. (Note that this does not mean that 95% of the population is insurable at standard terms. Some, by virtue of their age or state of health, may be discouraged from making an application.)

2.5 The groups into which risks are classified may change over time and will be influenced by views of what is or is not thought to be significant or politically or socially acceptable. 50 years ago it is quite likely that no distinction would be made between the genders because, at that time, the number of women in the insured population was relatively few. On the other hand, there have been moves within the European Community to outlaw gender distinctions on the grounds that this is inconsistent with legislation on equality.

2.6 It is clear that the system of risk classification is by no means perfect or immutable and even within these groups there will be differences in expected mortality or morbidity. It would be possible to expand the number of risk groups so that each is yet more homogeneous. However, in practice, insurers will take account of the cost and difficulty of obtaining further objective measures that would be necessary to refine the basic classification process. Furthermore, in a

market the size of Singapore, there may be very limited commercial merits in seeking to refine the classification of standard risks if, in the process, this limits the 'target' population to numbers that may be quite modest in absolute terms.

2.7 Apart from the basic risk classification criteria there are, of course, other factors which have a bearing upon the price of insurance and, indeed, upon insurability. Most obvious amongst these are the state of health and the medical history of the applicant. Hazardous occupations and pursuits may also affect the terms on which insurance may be offered. These are factors which very clearly have an impact on the likelihood of claim.

2.8 For this reason, insurers will seek information about the health and medical history of the applicant before accepting life or health insurance risks. The disclosure of relevant information is a pillar of the principle of *utmost good faith* upon which life insurance is based. Without the obligation of disclosure, the asymmetry of information between the applicant and the insurer would result in 'adverse selection' – meaning that those who have an indication of current or potential health problems would be more likely to buy insurance. This would lead to cross-subsidy between individuals presenting entirely different risk profiles – and ultimately to ever-increasing costs of insurance.

2.9 Evidence of the impact of asymmetry of information can be found from a number of sources. For example, in the early 1980s a number of UK insurers experimented with the granting of life insurance protection for mortgages with little or no investigation of the health status of the applicant. The theory had been that the very act of committing to a mortgage was a sufficient indication that the applicant thought that he or she was in good health. However the tracking of claims showed that the claim rate in the early years of such policies was 70% higher than in comparable policies that had been 'normally' underwritten [1]. The experiment was short lived!

2.10 Another study in the United States [2] followed 148 cognitively normal people participating in a randomized clinical trial of genetic testing for Alzheimer's disease. It was found that those who tested positive were 5.76 times more likely to have altered their plans for long-term care insurance. It was concluded that if genetic testing for Alzheimer's risk assessment becomes common, it could trigger adverse selection in long-term care insurance.

2.11 The extent of the health information that is obtained in the application process will depend upon the age of the applicant and the level and nature of the cover that is being sought. A significant proportion of applications are accepted on the basis of answers to questions in the application form. Where the level of cover being sought exceeds a certain point, the applicant may be required to undergo a medical examination. For yet larger sums assured, additional tests – such as chest X-ray or ECG – may be required. As a general rule, the older the applicant, the lower will be the trigger point for additional medical information.

2.12 Each insurer will specify its own precise requirements for medical information. Competitive pressures mean that there is a high degree of convergence but differences in detail remain.

2.13 If the information received is unremarkable, the applicant will be accepted on standard terms for the appropriate risk group. If not, the insurer will consider:

- Whether the deviation from the standard risk group is sufficiently small that standard terms can be offered nonetheless.
- Whether the risk can be accepted subject to an extra premium or, in the case of certain health insurances, subject to specific exclusions.
- Whether the acceptance should be postponed. (This is usually where the outcome of a particular condition is expected to become clearer within a specified time frame – for example pending the outcome of a course of treatment or impending surgery.)
- Whether the application should be declined.

2.14 Family history, *in isolation*, will not generally result in adverse acceptance terms for life (mortality) risks. There will, of course, be exceptions in the relatively rare cases of inherited monogenic conditions. However, family history may be one factor that is considered amongst others if it is relevant to the prognosis for other conditions that exist. For example, if the applicant has a history of heart disease, family history, along with other factors such as build, smoking habits etc. will be taken into account in deciding the terms of acceptance.

2.15 Family history does assume greater importance in the acceptance of *Critical Illness* risks. This is a class of business where the trigger for a claim is the *diagnosis* of one of a specified list of conditions regardless of how advanced the condition is at the point of diagnosis. A person with a vulnerability to a condition with known familial links is more likely to undergo regular screening (which we, hasten to say, is an unequivocally positive thing). Nevertheless, such a person is more likely to buy insurance after obtaining a positive test result. In addition, the fact remains that the individual is not only more likely to claim but is also likely to claim earlier because there is an improved chance that any problems will be recognized at an early stage of development.

3 The question of access to genetic information

3.1 Given the understandable sensitivities around the highly personal and familial nature of genetic information, questions are raised about the access that should be given to this information. These questions apply, inter alia, to insurers.

3.2 The Association fully understands that the link between genetic profile and the predisposition to disease is not well understood. Certainly, there is very little knowledge of the link between multifactorial genetic defects and other behavioural and environmental factors. We expect that it may be some time

before even those who are experts in the field of genetics are able to predict, with confidence, the impact of a specific genetic profile upon mortality or morbidity

3.3 As a result, today's reality is that very few genetic disorders have a known significance that can be quantified and which, *in the absence of other risk factors*, would warrant special treatment in acceptance terms. The exceptions are the well-known but relatively rare monogenic disorders. That being so, the results of a genetic test would, arguably, add little of value that could not be obtained by questions about family history.

3.4 For this reason, insurance companies in Singapore do not seek and, for the foreseeable future, have no intention of seeking, genetic tests as a tool for screening life insurance applications.

3.5 Nevertheless, one must draw the distinction between the active use of genetic tests as a routine tool for screening insurance applications and the more passive requirement to disclose the result of a test that has been conducted for some entirely different purpose.

3.6 We welcome and support Recommendation 22 of the report [Genetic Testing and Genetic Research] by the Bioethics Advisory Committee in which the Committee urges discouragement of genetic testing services outside of the framework of the healthcare profession. It would be a concern if the availability of proprietary tests were to encourage inappropriate insurance buying decisions based on unjustified fears or, conversely, to discourage purchase out of a misplaced sense of security. It would be of yet greater concern if the availability of proprietary tests went hand-in-hand with immunity from the obligation to disclose the results or, even, to declare that the test had been taken.

3.7 As noted in paragraph 2.8, asymmetry of information opens the risk of an unfair cross-subsidy in favour of those who are not required to disclose information. In terms of genetic test results, this may be of limited significance in the short term but could have more serious consequences if genetic technology establishes a place in mainstream medical practice. It would seem that this is already becoming a reality. According to the United Kingdom Genetic Testing Network, it has evaluated and approved some 300 tests as being relevant to clinical practice [3].

3.8 The impact of withholding information and the associated problems of adverse selection would become more acute where genetic technology leads to advancements in diagnosis of life threatening conditions that are not matched by improvements in treatment.

3.9 The Association is also concerned that, in this rapidly developing science, the perceptions and understanding of what constitutes 'genetic information' or a 'genetic test' will change over time and that meanings assigned to those terms

could, in future, have unforeseen and unintended implications for any restrictions on access to such information.

3.10 For these reasons, the Association would be very concerned if the principle of withholding genetic test information were enshrined as a right. There would be even greater concern if restrictions were extended to other related information such as family history.

3.11 The Association does not subscribe to the view, expressed by some, that 'genetic disadvantage' is inherently a case for special treatment. Each one of us will have scores of genetic 'flaws' and we are all, to an extent, a hostage to our genetic make up.

3.12 It is perfectly natural that when it comes to issues of rights of a disadvantaged group, public sympathies will be with the individual rather than a large corporation. However, it must be remembered that rights of one group are almost invariably balanced by the responsibilities that are transferred to another. Thus, if those with a genetic disadvantage were exempted from paying the appropriate price for their insurance cover, the cost of the subsidy would fall upon other policyholders – i.e. upon individuals and not upon large corporations. That being so, there must be doubt whether, in a voluntary and private system of insurance, it is equitable or sustainable to guarantee access to insurance for the genetically disadvantaged (however they may be defined) whilst denying a similar privilege to those disadvantaged by a clinically diagnosed condition.

3.13 We note the conclusions of the Australian Law Reform Commission [4]:

"Giving more favourable underwriting treatment to applicants because of the genetic basis of their disease creates an arbitrary distinction between individuals according to the source of their ill health or disability. It is not clear why a person suffering from a cancer that is (currently) not known to be genetically linked should be treated less favourably than a person suffering from a cancer that is. It is for these reasons that the Inquiry rejects the idea of 'genetic exceptionalism'..."

3.14 The Association is mindful of the benefits to society of the successful development of genetic technology and the place of research in that development. The industry would not wish to discourage tests that would be of potential benefit in the health management of individuals or to stand in the way of research participation.

3.15 Yet we are concerned that the barriers which insurance is said to pose to research are overstated and a further example of the ascendancy of perception over reality. For example, we have no evidence to suggest that fears for the implications for life insurance prevent individuals from participation in cancer screening examinations.

4 The statistical basis of life insurance pricing

4.1 Wherever possible, the statistics that underpin life insurance pricing are drawn from observation of the experience of a relevant insured group. The Society of Actuaries of Singapore produces regular mortality studies based upon data collected from the life insurance companies operating in Singapore.

4.2 By virtue of the different segments of the market in which they operate, the mortality experience of individual companies will differ one from another. However, most are likely to use the industry study as a starting point for their pricing of risks for the standard risk groups.

4.3 The assessment of risks that fall outside of the standard risk groups by virtue of the state of health or medical history of the applicant is an art – or a science – that has developed significantly over the latter half of the 20th century. Before that time, any history of significant illness was likely to have resulted in declinature. Since then, the boundaries of acceptance – albeit at special terms – have been steadily expanded to encompass applicants who may have some quite significant medical conditions.

4.4 Neither individual companies nor, indeed, the Singapore market as a whole will generate sufficient data to quantify the impact on mortality or morbidity of the full range and combination of medical conditions that may be encountered. Nevertheless it would be wrong to assume that the underwriting of these medical risks is arbitrary or capricious.

4.5 In arriving at the terms that may be offered for risks that are not acceptable at standard terms, insurers will rely upon:

- The professional judgement of the insurers' underwriters and medical officers and, in many cases,
- The underwriting manuals produced by the major reinsurance companies.

4.6 A substantial research effort goes into the production of reinsurers' underwriting manuals. These manuals are considered to be proprietary information and a source of competitive advantage so their underlying research is not put to public scrutiny. It is acknowledged that many of the recommended ratings do not have a basis of scientific evidence of the rigorous standards that might be expected in academic research. Nevertheless, reinsurers do take account of such authoritative longitudinal studies as are available. Where there are no recognized studies available, the recommended ratings will be based upon the judgement of the reinsurers' medical officers – in most cases with the advice of specialists in the relevant field.

4.7 Moreover, as noted by Daykin et al [5],

"It also needs to be borne in mind that insurers are taking risks for the long-term future. Statistical evidence from the past may be a guide, but it is only that Insurers have to take risks and accept uncertainty and it should be recognized that the underwriting process has to reflect such realities."

4.8 It is indeed a practical complication that if one traces the impact of a particular impairment over periods that can extend for 20, 30 years or more, the applicability of that data to similar periods into the future will be overtaken by the changes in treatment that will have taken place.

4.9 As a result, it is inevitable that there will be conditions where medical opinion would agree that there is an adverse impact on mortality or morbidity - even if the statistical information to quantify, in precise terms, the extent of the deviation from 'normal' is lacking.

4.10 In a competitive market, the pressure will be on underwriters to offer the best possible terms that are consistent with sound underwriting practice.

4.11 In extrapolating the challenges of assembling relevant data to the study of the impact of genetic abnormalities, it is again worth noting the comments of Daykin et al [5]:

"It is important to realise that genetic epidemiology yields results years or even decades after the disease-causing genes have been discovered in the laboratory. .... Since we are now just at the stage of identifying genes, it should be no surprise that epidemiology is sparse, at least compared with the demanding requirements of actuarial models. Moreover, most studies address medical questions and they follow the reporting conventions of medical statistics"

They went on to note that one of the specific problems was:

"Study populations are often small, so only a few figures are reported (median survival times, lifetime penetrances and so on)."

4.12 The implication is that the data available is not sufficiently detailed to derive the parameters required for actuarial modeling. As a result, it will take a long period of observation before the industry is able to develop objective measures of the significance of predictive genetic knowledge.

5 An International Perspective

5.1 In 1997, the Council of Europe adopted a Convention for Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine. Article 11 of the Convention states *"Any form of discrimination against a person on the grounds of his or her genetic heritage is*

prohibited." Article 12 limits the use of genetic test to healthcare and research linked to healthcare.

5.2 Only a few European countries, for example, Austria and Belgium, have reached for the statute book and imposed legislation to prevent insurers from obtaining or using genetic test results [6].

5.3 The UK has not ratified the Convention but there is an agreement between government and the insurance industry to have a moratorium on the use of genetic test results other than in specific circumstances [7].

5.4 In the USA, the responsibility for insurance supervision lies principally with the 50 state insurance departments. 16 states have introduced measures that restrict insurers' ability either to use or obtain genetic information. At the federal level, genetic non-discrimination bills were introduced that would have had the effect of limiting insurers' access and use of genetic information. However, the driving force behind the proposed legislation was the paramount importance of access to private medical insurance. There appears to be support for the industry's view that life insurance, disability income and long-term care be treated separately from health insurance. To date, none of these bills has been passed into law [6].

5.5 In both Canada[8] and Australia[9], insurers have confirmed the policy that they would not require applicants to undergo a genetic test although applicants are required to disclose results of tests taken for other purposes.

6 Conclusions

6.1 The Association sees positive benefits from the development of genetic technology and has no wish to inhibit the research effort.

6.2 We believe that fears of the emergence of a 'genetic underclass' are based more on poorly-informed speculation than upon fact.

6.3 Insurers have no intention to seek genetic tests as a part of the screening process for life or health insurance applications.

6.4 The bigger question arises over the access to genetic test results carried out for another purpose. We underline the fact that the industry has much greater interest in accepting business than turning it away unless there is good reason to do so. As with any other medical information, genetic information would only adversely affect insurance terms if there is evidence linking the information to the claim trigger.

6.5 We acknowledge that, at this point, the numbers of tests that have proven and quantifiable relevance are relatively few. Nevertheless, genetic research is

progressing rapidly and will continue to progress in directions that we cannot accurately predict. In the light of this uncertainty, the Association would have concerns if the principle of withholding genetic test information were to be enshrined as a right.

6.6 We refer again to the conclusions of the Australian Law Reform Commission [4]:

"In the light of these considerations, the Inquiry has formed the view that a departure from the fundamental principle underlying the market in voluntary, mutually rated personal insurance in Australia, namely, equality of information between the applicant and the insurer, cannot be justified at this time."

6.7 The Association holds the view that, in preference to restrictions on access which may prove inappropriate in the longer term, a more positive approach would be to engage in a dialogue with the Bioethics Advisory Committee or such other body or bodies as may be appropriate with the objective of:

6.7.1 Improving education in the wider community to allay commonly held misconceptions. In this way, the perceived barriers to research, posed by insurance, may be put into clearer perspective;
6.7.2 Establishing codes of conduct for use of genetic test information by insurers, and
6.7.3 Improving education within the industry to ensure fairness and transparency in the use of genetic test information.

7 Acknowledgement

7.1 A number of sections of this paper rely heavily on the work of J. Lockyer, P. G. Brett, S.A. Hannington, J.A.N. Lockyer, A.S. Macdonald and J.J. Woods in the paper, "Genetic Science and its Implications for Life Insurance" [10].

8 References

[1] Institute and Faculty of Actuaries: Continuous Mortality Investigation Reports No. 11
[2] C.D. Zick et al (2005): Genetic Testing for Alzheimers disease and its impact on insurance buying behaviour, *Health Affairs v24,No.2*
[3] UK Genetic Testing Network (2005): NHS Directory of Molecular Genetic Testing
[4] Australian Law Reform Commission ALRC 96 (2003) Essentially Yours: The Protection of Human Genetic Information in Australia.
[5] C. D. Daykin et al (2003): Genetics and Insurance – Some Social Policy Issues, *British Actuarial Journal 9 IV, 2003*

[6] J. Buerger, A. Regenauer: Genetic Testing and Insurance – A global view, 2nd edition, *Munich Re publication*
[7] HM Government (UK) and Association of British Insurers (2005): Concordat and Moratorium on Genetics and Insurance
[8] Canadian Life and Health Insurance Association Inc. (2000): Genetic Testing: Industry Position
[9] Investment and Financial Services Association Ltd. (2002):Life Insurance and Genetic Testing in Australia
[10] J. Lockyer et al (1998) : Genetic Science and its Implications for Life Insurance, *Transactions of 26th International Congress of Actuaries, Vol. 3.*

Life Insurance Association, Singapore, April 2006

THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

A CONSULTATION PAPER

THE BIOETHICS ADVISORY COMMITTEE

SINGAPORE

14 June 2006

The Use of Personal Information in Biomedical Research

Executive Summary

Part I: Introduction

1. Biomedical research is a public good. Without it, advances in medicine would be impossible. This Consultation Paper discusses the need to use personal information in biomedical research and makes recommendations aimed at establishing principles for privacy protection and confidentiality consistent with legitimate research needs.

2. We identify five issues for discussion:

   (a) What is personal information?

   (b) Do we require a legal framework for the protection of privacy and confidentiality?

   (c) Issues of informed consent;

   (d) Issues of privacy and confidentiality; and

   (e) Issues of access by third parties such as employers or insurance companies.

Part II: Personal Information

3. A broad definition of personal information is adopted. The Paper treats as personal any information that is information about a particular person. It is not just information of an inherently private or personal nature. For example, a blood sample yields information about a person's blood group. However, the type of blood group is not considered personal information, unless the identity of the person providing the sample is known. Information about the blood group of a known person would be information about that person. It would be personal information.

4. Only if proper steps are taken to protect the identity of research participants can their personal information be used for research purposes without breach of privacy. For this reason, de-identified information is used where possible in research; and sometimes, the de-identification is done in such a way that it is

permanent and irreversible, so that the identity of the person concerned cannot be known. There are various ways in which a greater or lesser degree of security can be obtained using de-identification procedures. In general, the more sensitive the information, the more care is needed to ensure that the identity of the person concerned is protected and their personal information kept secure.

5. Sometimes the information needed is patients' medical information, that is, information provided to a physician for purposes of diagnosis or treatment. Such information is kept in medical records. Sometimes personal information needed in research is obtained from volunteers who are not patients. Sometimes the needed information is genetic information, which may or may not be medical information. Medical and genetic information are also examples of personal information.

Part III: The Legal Protection of Personal Information

6. In paragraphs 3.1-3.6 the Paper considers whether or not some general legal framework is needed, and concludes that it is. A legal framework that protects privacy while allowing the legitimate use and exchange of information may be valuable in its own right, and may be essential if researchers in Singapore are to collaborate with researchers in other jurisdictions.

7. Singapore's existing laws provide for privacy protection in specific circumstances, such as between banks and their customers, and between solicitors and clients, but currently there is no overall statutory framework for the protection of personal information. A legal regime for personal information protection could provide a general framework for public engagement and for policy development.

8. A general privacy protection law could also assist the development of realistic expectations on the part of researchers and prospective research participants regarding the use of personal information in biomedical research. In particular, the management of de-identified information, the right of access to research data by participants, and the use of information for epidemiological research and public health research, are all matters where particular provisions may be helpful.

Recommendation 1: We recommend that the relevant authorities consider establishing a legal framework for the use of personal information in biomedical research.

Part IV: Informed Consent

9. In paragraphs 4.1-4.5 the Paper briefly considers the issue of informed consent and confidentiality, which are the fundamental means to privacy protection, and explains specific and general consent.

Section A: Consent and Proportionality

10. When a researcher asks a person to provide tissue or personal information for research, specific informed consent for the research is needed. However, an additional general consent for future research may also be taken. When general consent for future research is given, it relieves the researcher of the need to re-contact the individual concerned for a fresh consent, provided that the information or tissue is stored and used as de-identified material. Generally, the process of obtaining informed consent and details of information to be provided should be in proportion to the sensitivity of the information and risk of harm to the individual. The approval of a research ethics committee or an Institutional Review Board (IRB) is required before research can proceed. Paragraphs 4.6-4.16 discuss this.

Recommendation 2: Specific consent should be obtained when research involves identifiable personal information or tissue samples. General consent may be obtained for subsequent research involving the use of de-identified information or remnant tissue. The information to be provided to the individual when taking consent should depend on the sensitivity of the information and the risk of harm.

Section B: Reciprocity, Disease Registries, Epidemiological Research and Public Health Research

Disease Registries

11. Paragraphs 4.17-4.29 relate to the use of information held in disease registries. Such information is essential to disease prevention, public health planning and policy-making, as well as research aimed at improving public health. Accordingly, we consider it to be ethically proper for medical information to be disclosed by physicians to disease registries without patients' consent, provided that adequate privacy and other ethical safeguards are in place, and patients are appropriately informed.

12. In addition to the ethical basis for this position, there are a number of practical difficulties that will make a strict requirement of consent inappropriate for research using information from such registries, including the very large numbers of patients often involved and the likely desire of some patients not to be contacted. These reasons were also identified by the UK Academy of Medical Sciences.

13. Disclosure of medical information to a disease registry could be in breach of medical confidentiality if done without the patients' explicit consent. In other jurisdictions, there has been a move towards legal regulation of disclosure. We are of the view that public health purposes could justify a similar move in Singapore.

Recommendation 3: We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to disease registries by health care institutions and physicians; and establish mechanisms enabling the registries and healthcare institutions to increase the accessibility of personal information for research that can significantly advance public welfare, while safeguarding privacy concerns.

Epidemiological Research and Public Health Research

14. Paragraphs 4.30-4.34 consider non-disease public registries, such as the Registry of Births and Deaths, which are an invaluable resource for biomedical research. Where disclosure of identifiable information by a public registry is permitted by law or regulation, the ethical principles of informed consent and confidentiality should apply in the same manner as they do for medical registries, which include disease registries, custodians of medical records, and other similar registries of medical information.

15. However, while a consent requirement exists before identifiable personal information is used in research, it should arguably not extend to the use of reversibly de-identified information provided there are adequate provisions to protect privacy and confidentiality. It is possible to link data between registries and allow research access to personal information without compromising confidentiality and privacy concerns.

16. While informed consent should generally be obtained for the research use of personal information, the procurement of consent may not be possible or practicable in every situation. There may be cases where there is public health justification for certain research to proceed even where the consent requirement is not satisfied, if it poses minimal risk to individual privacy and confidentiality of personal information. The types of research that typically qualify for such special treatment are epidemiological research and public health research, either of which may include the use of medical records. However, appropriate mechanisms for this may only be put in place through legislative means and we recommend that the relevant authorities consider establishing them.

Recommendation 4: We recommend that the relevant authorities consider establishing legal mechanisms to facilitate the use of personal information in registries, databases and medical records for epidemiological research and public health research. These mechanisms should also ensure that there is minimal risk to individual privacy and confidentiality.

Section C: Clinical Audit and the Electronic Medical Record Exchange

17. Paragraphs 4.35-4.43 deal with the use of medical records for clinical audits carried out by physicians or healthcare institutions to monitor and evaluate the quality of the medical services provided. Audits may entail access to the medical records of patients, and will increasingly extend to cover more than one institution as the Electronic Medical Record Exchange (EMRX) comes into use.

18. When physicians report their own cases in the medical literature, it has usually been accepted that such clinical reviews need not entail consent and IRB review. Clinical reviews are primarily the means by which physicians maintain and improve their clinical knowledge and skills. We are of the view that existing custom and practice need not be changed in this regard, as it already contains privacy and confidentiality safeguards.

Recommendation 5: We recommend that the relevant authorities consider legal provisions necessary to ensure that the potentially increased scope of clinical audit does not violate medical confidentiality and to assure the public that privacy and confidentiality interests in personal information will be safeguarded.

Section D: Additional Considerations about Consent

19. Certain additional considerations about consent are covered in paragraphs 4.44-4.52, specifically vulnerability and withdrawal of consent. Vulnerability may be thought to occur if one's ability to give informed and voluntary consent is compromised or if one would be at heightened risk for adverse consequences of the research. Three common categories of vulnerable persons are:

    (a) children and adolescents;

    (b) the mentally impaired; and

    (c) persons in dependent relationships.

20. When vulnerable persons are involved in research, they are entitled, as a general rule, to the same considerations of privacy and protection as any other research participants, and this principle needs to be kept in mind when consent is taken, whether directly or by proxy.

Recommendation 6: We recommend that IRBs, when reviewing research, ensure that any concerns in regard to vulnerable persons are appropriately addressed.

Recommendation 7: Research participants should be allowed to withdraw their consent to participate in a research at any time without explanation and without prejudice. They should be assured that upon withdrawal their personal

information and/or tissue samples will either be destroyed or irreversibly de-identified.

Part V: Privacy and Confidentiality

21. Paragraphs 5.1-5.5 deal with the need to store and manage personal information in ways that provide proper security and confidentiality, and a number of specific suggestions are made. The two most important are:

    (a) that research data should not be made available to insurance companies or employers, because it is not obtained for health purposes and can be misleading if used outside the research; and

    (b) that while a researcher collecting data from consenting individuals will know their identities, such information should be stored and managed as de-identified information as far and as early as possible.

Recommendation 8: Personal information should be de-identified as far and as early as possible and should be stored or transferred as de-identified information.

22. Paragraphs 5.6 & 5.7 are a reminder that confidentiality requires that researchers not only take proper security safeguards with data, but refrain from trying to identify an individual from de-identified information.

Recommendation 9: Researchers should not attempt to identify an individual from de-identified information as it is a serious breach of ethics to do so.

23. Paragraphs 5.8-5.11 are concerned with irreversibly de-identified personal information. Irreversibly de-identified information should not be subject to privacy and confidentiality requirements, provided that proper measures are taken to ensure that the de-identification really is irreversible. In particular, this means protecting participants whose anonymity might otherwise be threatened by the uniqueness of the information, or the availability of a detailed and complete profile however anonymous.

Recommendation 10: Irreversibly de-identified personal information generally need not be subject to privacy and confidentiality requirements.

24. When personal information is reversibly de-identified, the extent and thoroughness of de-identification should be balanced against the likely harm that would follow in the event that an individual is identified. It is the responsibility of the IRB to consider the extent and means of de-identification proposed. Paragraphs 5.12 & 5.13 consider this.

Recommendation 11: When reversibly de-identified information is used for research, IRBs should consider the adequacy of the extent and means of the de-identification in proportion to the risk. Should a person be identified from de-identified information, the person should still enjoy confidentiality and privacy entitlements.

25. Paragraphs 5.14-5.16 deal with the principle of proportionality as applied to the use of personal information in medical or public registries. The level of confidentiality safeguards, whether in the extent of de-identification or otherwise, should be commensurate with the potential risk to research participants. Generally, the confidentiality obligation of research institutions involved in large-scale research initiatives will be more wide-ranging than research performed by a single researcher.

Recommendation 12: The ethical principle of confidentiality should apply to the use of personal information from medical or public registries. Confidentiality safeguards should be commensurate with the potential risk of harm from inadvertent disclosure.

Part VI: Access to Medical Information by Employers and Insurers

26. Paragraphs 6.1-6.15 discuss third party access to medical information. Medical information should not be disclosed to third parties without the individual's consent, although there are circumstances when an employer or an insurance company may reasonably expect disclosure of health conditions. Research information should not be disclosed to third parties at all.

27. The main ethical difficulties arise when predictive information is involved, especially genetic information. Predictive health testing, even for monogenic disorders, often entails a high level of uncertainty. There is a conflict of interest between the desire of an employer or an insurer not to take an unnecessary risk at a possible cost, and the desire of employees, applicants, or prospective policy holders not to experience discrimination in eligibility for jobs or insurance cover on the basis of slender evidence or a probability.

28. The key issue is perhaps the concealment of immediately relevant information. In the case of employment, the use of valid genetic or other health testing by employers is appropriate to address imminent health and safety concerns, or where the detected or predicted condition is incompatible with the requirements of the job.

29. In the case of insurance, we recognise the potential 'adverse selection' problem that may arise as if relevant information is withheld, and that risk evaluation for the purposes of determining insurance coverage inherently involves

discriminating between applicants. However, we empathise with the public's concern of possible discrimination in the availability of insurance coverage. Nor do we wish to see individuals deterred from obtaining needed information about their medical conditions on the grounds that they might then be obliged to disclose it.

30. In our view much of the difficulty arises from uncertainty as to the actuarial value of genetic information, and our preferred solution is a moratorium, as in the UK, whereby predictive genetic test results will not be used by insurers, although certain exceptions apply.

Recommendation 13: We recommend that the government consider implementing a moratorium on the use of predictive genetic information for insurance purposes and appoint an authority to consider long-term implications of the accessibility of predictive genetic test results by employers and the insurance industry and to monitor developments in this area.

The Use of Personal Information in Biomedical Research

Consultation Paper

I. Introduction

1.1 Modern scientific medicine, in its entirety, is a research-based enterprise, and biomedical research has been critical to advances in medical science and public health. Research has improved understanding of the effects of medication, of how our environment and/or lifestyle relates to diseases (such as smoking and cancer, heart and lung diseases), and longevity, and of the effectiveness of preventive and therapeutic practices. Sound research promotes public good and the facilitation of biomedical research is a public interest. Such research critically depends on the use of personal information[1] from research participants.

1.2 Personal information may be medical information, genetic information, demographic information, or other information of a personal and private nature. The people from whom it is obtained include patients and volunteers who agree to participate in research (i.e. research participants); they may be alive, or deceased. The information may be derived from tissue samples, medical records, researchers' data files, or institutional databases; and these institutions may be of a public or private character. In all cases, the privacy of the persons concerned needs to be protected, since the information is personal and may be sensitive. Consequently, there are rules and conventions regarding the confidentiality and use of research data in general, and medical records in particular.

1.3 Despite these rules and conventions, people may nevertheless be concerned that information about them will be used against their interests. This is a general concern, fed by awareness of the extent to which information can be captured, stored and used by electronic means, and it is also a specific concern in the case of research. Such a concern is not unique to Singapore. It drives privacy and data protection issues in many parts of the world.

1.4 The modern view is that there should be explicit regulation of who may access personal information, and what it can be used for. In the case of research, many scientifically advanced countries have established ethical and legal frameworks to maintain public confidence in and support for the research enterprise. In addition, efforts directed at engaging the public in consultation and education have significantly increased in Australia, Japan, North America and Western Europe.

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[1] The term "personal information" is explained in paragraph 2.1.

1.5 This Consultation Paper considers the need for similar provisions in Singapore, where despite a commitment to developing biomedical research capabilities, the ethical and legal standards for the use of personal information for biomedical research are not always clear. It strikes a balance between ensuring appropriate privacy safeguards and public confidence on the one hand, and facilitating access for research of legitimate public interest on the other. We identify five important issues that serve to structure the Paper as a whole:

(a) What is personal information?

(b) Do we require a legal framework for the protection of privacy and confidentiality?

(c) Issues of informed consent;

(d) Issues of privacy and confidentiality; and

(e) Issues of access by parties such as employers or insurance companies.

1.6 The purpose of this Consultation Paper is to set out these issues as a basis for obtaining feedback from healthcare, research and governmental institutions, relevant professions, religious organisations, as well as members of the public. Feedback received will be considered by the BAC and a final report will be submitted to the Steering Committee on Life Sciences.

1.7 In preparing this Consultation Paper, we have been mindful of the need to distinguish between ethical issues, and the limitations of the current legal or regulatory frameworks arising from recent advances in biomedical science. For this reason, we have not only made recommendations on ethical issues, but have at several points proposed clarifying the legal framework within which ethical decisions are made and implemented.

1.8 Many of the ethical issues reviewed in this Paper will have relevance to the work of research ethics committees or Institutional Review Boards (IRBs). It is important that IRBs, whose primary function is to safeguard research participants, feel able to make the best decision, having regard to the needs of the researchers and the value of the research. They must feel able to do this, without pressure to adopt the safest and most conservative decision just to avoid legal repercussions, either for themselves or the institutions that appoint them.

1.9 The aim of this Paper is to explicitly outline ethical principles and best practices in the use of personal information for biomedical research. This will enable researchers to be clear as to acceptable legal and ethical boundaries, and it will help to assure the public that proper safeguards are in place or contemplated.

1.10 In addition to the consent and privacy concerns discussed in this Consultation Paper, we note, as a general ethical requirement, that research must be conducted in ways that ensure the welfare and safety of individuals. In a multi-cultural and multi-religious society, researchers and healthcare professionals should also be sensitive to the religious and cultural perspectives and traditions of individuals.

II. Personal Information

2.1 Generally, personal information is data relating to an individual who can be identified from that data or from a combination of that data and other information which is in the possession of, or is likely to come into the possession of, a data controller or custodian.[2] It is a very broad term, including personal particulars, details of medical conditions and health care management, physical or psychological measures, dietary, religious or other beliefs, identifying particulars such as National Registration Identity Card (NRIC) number, or any other information which is linked to a specific identifiable person.

2.2 The most restrictive treatment of personal information is often reserved for the most sensitive information. To determine the sensitivity of the information, it may be important to distinguish between information that *identifies* an individual (such as a person's name), and information *about* an individual (such as that person's medical history). Personal information may be obtained through written or electronic records, opinions, survey questionnaires, images, interviews, recordings and biochemical or other tests, or from analysis of human tissue.[3] Some of the information may not be especially sensitive (like height and weight), but very often, it may be sensitive and should be regarded as private. However, such information should only be considered private if it is linked to information that *identifies* the individual. Information that identifies an individual includes personal particulars such as name, address, date of birth, image (such as picture, photograph, video), voice recording, NRIC number or other means of identification. In most cases, sensitive personal information relates to living individuals. However, personal information of deceased persons can also be sensitive.

2.3 Identifying information can also be some combination of personal data and other information in the possession of whoever keeps the data. In addition, there are unusual situations where an extremely rare condition in a small community

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[2] This definition is based on that given in the UK Data Protection Act 1998, Section 1(1).

[3] Human tissue is defined in paragraph 2.1 of our report on Human Tissue Research (BAC, 2002) as "all kinds of human biological materials derived from living or cadaveric donors, including solid body tissues, organs, foetuses, blood and other body fluids and their derivatives, cord blood, embryos, gametes (sperm and eggs) or any part or derivative thereof."

can identify an individual. Information that identifies an individual in this way may thus be sensitive and raises privacy concerns even when it is not linked to other identifying information.

2.4 Medical information is a particular kind of personal information. It refers to all information about a patient that is provided to a physician[4] or derived for the purpose of diagnosis or treatment, and includes the results of medical investigations ordered by the physician. Information so collected is typically recorded, managed and used as medical records, which are governed by a system of ethical and legal requirements, notably those set out by the Singapore Medical Council.[5]

2.5 Certain personal information, such as genetic information, blood group, or current medication, may or may not be considered medical information, since this depends on whether or not it was provided to a physician for purposes of treatment or diagnosis. Genetic information broadly refers to any information about the genetic makeup of an individual. It can be derived from genetic testing or from any other sources, including a family history of genetic disease.[6] The term "personal information" in this Consultation Paper includes all personal genetic information used in biomedical research.[7] In our Genetic Testing and

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4 A physician is a person qualified to practice medicine under the Medical Registration Act.

5 Paragraph 4.1.2 of the *Ethical Code and Ethical Guidelines* of the Singapore Medical Council states the general content of clinically relevant information that should be documented as medical records: "All clinical details, investigation results, discussion of treatment options, informed consents and treatment by drugs or procedures should be documented." The same paragraph stipulates that medical records be kept in a manner that is clear, accurate and legible, made during consultation or shortly thereafter, and of "sufficient detail so that any other doctor reading them would be able to take over the management of a case." In addition, a physician is to "respect the principle of medical confidentiality and not disclose without a patient's consent, information obtained in confidence or in the course of attending to the patient" (paragraph 4.2.3.1).

6 Paragraph 3.1 of *Genetic Testing and Genetic Research* (BAC, 2005).

7 The term "biomedical research" in this Consultation Paper refers to "human biomedical research", which includes Direct Human Biomedical Research and Indirect Human Biomedical Research as defined in paragraph 3.7 of our IRB Report (*Research Involving Human Subjects: Guidelines for IRBs*, BAC 2004). It does not include research in the social sciences or humanities. Direct Human Biomedical Research is "any kind of human biomedical research that involves any direct interference or interaction with the physical body of a human subject, and that involves a concomitant risk of physical injury or harm, however remote or minor" (paragraph 3.7(a) of the IRB Report). Indirect Human Biomedical Research is "any research (not qualifying as Direct Human Biomedical Research) involving human subjects, human tissue, or medical, personal or genetic information relating to both identifiable and anonymous individuals, undertaken with a view to generating data about medical, genetic or biological processes, diseases or conditions in human subjects, or of human physiology or about the safety, efficacy, effect or function of any device, drug, diagnostic, surgical or therapeutic procedure (whether invasive, observational or otherwise) in human subjects whether as one of the objectives or the sole objective, of the research study, trial or activity, and which research, study, trial or activity has the potential to affect the safety, health, welfare, dignity or privacy of the human subjects involved in the study, or of the donors of human tissue or information used in research, or of the family members of any of the human subjects or donors thereof, or to

Genetic Research Report, we focused on issues relating to the derivation of genetic information, and we provided recommendations for the ethical derivation, management and use of genetic information. In many respects, considerations in this Consultation Paper follow from points made in that report.

2.6 When personal information is used in research, it is necessary that the confidentiality of the information is ensured and thus the privacy of the person is protected, throughout the research process and in any publication resulting from it. Both these aims are usually achieved by de-identification of the information.

2.7 For the purposes of this Consultation Paper, we distinguish identifiable personal information from de-identified personal information, as follows:

(a) *Identifiable personal information*: Information that allows the identification of an individual;

(b) *De-identified personal information*:

(i) Reversibly de-identified information, in which personal identity information has been removed, and a code substituted, so that the identity of the person could be restored under strict conditions; and

(ii) Irreversibly de-identified information, which is information that has been permanently stripped of identifying details and therefore cannot be used to identify an individual.[8]

2.8 In this Consultation Paper, we consider the use of personal information for the purposes of biomedical research. We also briefly address the use of personal information for clinical audit. We are not otherwise concerned with the collection, management and use of medical information in clinical contexts, since these are already subject to clear ethical and legal standards.

III. The Legal Protection of Personal Information

3.1 The trend in many countries is towards the establishment of a uniform legal framework for the privacy protection of personal information. Much impetus to

which such medical, personal or genetic information relates" (paragraph 3.7(b) of the IRB Report).

[8] The concept embodied in the terminology is consistent with that adopted by the Ethics Committee of the Human Genome Organization in 1998 (Genome Digest, 86 (1)). See Knoppers and Saginur (Nature Biotechnology, 23 (8) p.925) for a discussion of the terminological confusion in this area.

such a trend arises from unprecedented advances in information technology, allowing the enhanced accessibility and manipulation of electronically stored information. This creates new research opportunities, but poses new risks to the violation of privacy and confidentiality.[9] Scientifically advanced countries have considered it necessary to establish legal regimes for privacy protection in order to facilitate the exchange of personal information. Their experiences have been instructive and their most relevant provisions for the use of personal information in biomedical research are as follows:

(a) Research use of personal information is regulated within a comprehensive personal information protection regime. Consequently, a minimum privacy standard applies across various ways of using information, including those for medical and research purposes. Personal information that ceases to be identifiable or is unlikely to cause harm to anyone is generally exempted from the requirements of the regime. Such exempted information is typically irreversibly de-identified personal information or aggregate information that cannot identify any particular individual. The extent to which personal information protection regimes should apply to reversibly de-identified information, however, has been a contentious issue. We address this concern in Part V below;

(b) Personal information protection regimes generally allow individuals the right of access to their identifiable personal information held in a databank or register, to ensure correctness of the information. However, access is not feasible in the case of biomedical research databases held in de-identified form since the researcher is unable to identify an individual;

(c) Privacy provisions usually limit information collection, storage and use to specific purposes, but such provisions may not be applicable in research, since it is not possible to foresee all the research uses of the information. Similarly, while the destruction of information after a suitable period is usually mandated under privacy protection laws, research data should normally be preserved in case fresh information or theories require re-analysis; and

(d) Many personal information protection regimes explicitly recognise the public interest as including certain kinds of research. Special mechanisms have been established to make available personal

[9] By "privacy" we mean "the quality of being secluded from the presence or view of others", thus, the keeping of one's personal information away from others. By "confidentiality" we mean "treatment of information that an individual has disclosed in a relationship of trust and with the expectation that it will not without permission be divulged to others in ways inconsistent with the understanding of the original disclosure". In other words, one has some right to privacy, and one has the right to expect that proper safeguards will operate to ensure that private information is treated as confidential by those to whom it is divulged.

information for epidemiological research and public health research. We consider this aspect in greater detail in Part IV below.

3.2 With the globalisation of research, we anticipate that the collaborative exchange of de-identified personal information will become increasingly necessary. If this occurs, countries with privacy protection regimes will expect equivalent protection in countries with which such information is exchanged. We are therefore of the view that this is an appropriate time for the relevant authorities in Singapore to consider establishing a legal regime for the protection of personal information in biomedical research. This regime should address issues relating to the transfer of personal information to a third party and should provide judicial remedies and sanctions for any breach. We note that in many jurisdictions a public authority or agency is established to administer the regime.

3.3 We believe that most Singaporeans expect that their personal information will be kept confidential and that physicians and researchers alike will act responsibly and sensitively in managing it. However, the current level of public awareness in relation to the use of personal information in biomedical research is likely to be low. The establishment of a personal information protection regime carries a two-fold benefit: first, it provides a framework for public engagement and for policy development. We note that policy-makers in Australia, Japan, North America and Western Europe rely heavily on various forms of public consultation for formulating appropriate levels of privacy protection. Given the nature of the subject matter, this process of public engagement is an ongoing one. Second, it promotes the development of realistic expectations on the part of both researchers and prospective research participants regarding the use of personal information in biomedical research. Even though internationally recognised standards and best practices are available, every jurisdiction that has established a personal information protection regime has had to decide for itself the fundamental concerns it has in relation to personal privacy and the kinds of public interest that can override these concerns. A clear and realistic appreciation of privacy concerns is the foundation of public confidence.

3.4 While we support the establishment of a personal information protection regime in Singapore, both regulators and the public should understand that the objective of the regime is to facilitate (rather than limit) the appropriate use of personal information through the provision of proper safeguards. Regulators, IRBs and information custodians should guard against a disproportionate emphasis on certain requirements under the regime, notably the requirement of informed consent for the use of personal information, which is a general requirement in such regimes. This occurred in Germany, Japan, the United Kingdom and the United States, and it severely limited important public health research, necessitating subsequent remedial regulatory action.

3.5 The reputation of Singapore as a centre for responsible biomedical research requires the development of a robust but sensible legal framework for personal information protection, taking into account internationally recognised standards and best practices.

3.6 Personal information is widely used in biomedical research. As with other leading jurisdictions, we consider the ethical principles of informed consent and confidentiality to be the key principles in such use, because it is these principles that protect the privacy of the individual. Wherever possible, individuals should know how their personal information which they have provided in the course of medical care or for research may be used, how their privacy will be protected, and should be given the opportunity to withhold consent if they so wish.

Recommendation 1: We recommend that the relevant authorities consider establishing a legal framework for the use of personal information in biomedical research.

IV. Informed Consent

4.1 Generally, the use of personal information in biomedical research requires the informed consent of the individual concerned and the approval of an IRB. In most situations, researchers will only require access to de-identified personal information. In these cases, specific consent need not be obtained if the individuals have earlier provided a general consent for their personal information to be used for research, and the research has been approved by an IRB.

4.2 Specific consent is consent for a specific research project or for a specific purpose. General consent is consent that does not limit the use of the information or tissue contributed to a specific project or purpose. General consent is thus usually taken for future research, when no specific project has been planned. When a general consent is to be taken, patients or research participants must be provided with sufficient information to make an informed decision and be assured that all future research has to be approved by an IRB and that there will be safeguards to protect their privacy and the confidentiality of their personal information.

4.3 Medical confidentiality requires that a patient's informed consent be obtained before his or her medical information may be used in research. For consent to be valid, sufficient information must be provided to the individual. This obligation arises from the requirement that an individual's involvement in research must be voluntary. Even if the information is de-identified, the individual concerned must at some point have consented to the use of his or her information in research unless such research falls within the limited exceptions discussed below.

4.4 The need for informed consent and for privacy and confidentiality are two separate and necessary requirements for the use of personal information in research. The fact that consent has been obtained does not mean that privacy and confidentiality obligations are abrogated. Similarly, even if the confidentiality of personal information is assured, informed consent must still be obtained in order for it to be used in research.

4.5 While the general ethical requirement is that informed consent must be obtained for the use of personal information in biomedical research, there are arguably certain exceptions. The provision of medical information by physicians to disease registries is one such case that we discuss in Section B below. In addition, the experience of scientifically advanced countries suggests the need of a mechanism whereby the consent requirement may be dispensed with in exceptional situations involving research that poses minimal risk to the individuals concerned and advances public benefit. Such research usually relates to public health, and certain bodies or authorities (such as an IRB or a government agency) are empowered by legislation to determine if research access should be permitted. In Section B below, we propose a similar mechanism be established in Singapore. But first, we consider the manner in which requirements in consent taking should take into account the principle of proportionality.

Section A: Consent and Proportionality

4.6 Informed consent is generally required for obtaining personal information or tissue samples for research. When personal information or tissue is to be stored or used for future research, additional consent should be obtained. This additional consent may be a general consent, in that no specific type of research need be identified at the time of consent-taking.

4.7 When a research participant is also a patient, his or her specific consent for research use of personal information or tissue samples should be separate from the consent needed for any medical treatment. If information or tissue obtained in the course of medical treatment is to be stored and used for future research, consent should also be sought. This additional consent for future research use may be a general consent.

4.8 In instances where a patient may also be a potential research subject, we reiterate that particular caution is necessary when the attending physician is also the researcher. As we have discussed in our previous reports on human tissue research and guidelines for IRBs, patients may feel under obligation to their physicians. For this reason, we recommend that consent for research participation in such a situation be obtained by a competent third party.

4.9 When personal information or tissue obtained specifically for research (but not in the course of medical treatment) is to be stored or used for future research, additional consent should be obtained. This additional consent may be a general consent.

4.10 At the time when a general consent is taken, researchers should provide the assurance that all subsequent research use of information or tissue would require approval of an IRB, that such materials would not be used in ways likely to identify the research participant individually, that the research participant has the right to withdraw his or her consent at any time without giving any reasons and that if he or she is a patient, refusal to consent will not affect the quality of the medical care to which he or she is entitled. In addition, any reasonable possibility of commercial use of the information or tissue should be indicated. The extent of information to be provided will depend on the degree of actual or perceived risk.

4.11 Researchers and IRBs should be mindful of possible public sensitivity towards certain types of research. If it is likely that personal information or tissue contributed by research participants may be used in any type of sensitive research, specific consent must be obtained. General consent is inappropriate for research involving the use of identifiable personal information or for sensitive research. The Nuffield Council on Bioethics has considered certain types of genetic research that may be of public concern, such as those relating to personality, behavioural characteristics, sexual orientation or intelligence.[10] Where it appears to an IRB that an issue of public sensitivity may arise, the IRB may require specific consent to be obtained for the use of personal information or tissue sample, unless it is irreversibly de-identified.

4.12 We stress that biomedical research using personal information tends to serve public welfare. It mostly requires the use of de-identified information, which carries little risk of harm. It would not be prudent to constrain such research by always imposing the particularly stringent standards needed to manage exceptionally sensitive information. In general, under the principle of reciprocity, one might presume that irreversibly de-identified information should be readily available for benevolent purposes, though the individual should be able to opt out. The goal of ethics guidelines is to ensure ethical propriety in the conduct and regulation of biomedical research. Such guidelines are intended to promote a culture of confidence that facilitates rather than hampers responsible research.

4.13 Accordingly, the process of obtaining informed consent should be detailed in proportion to the sensitivity of the information and the actual or perceived risk of harm to the individual concerned. Informed consent should be explicit and in

[10] Nuffield Council on Bioethics, Genetics and Human Behaviour: *The Ethical Context* (October 2002).

writing[11] where the risk of harm to the individual is appreciable, for example if tissue is sought for research from an at-risk individual undergoing elective surgery, and the information provided should be correspondingly detailed. Where the risk is low or non-existent, less information may suffice for the participant to feel able to give consent.

4.14 Personal information or tissue that is provided for research by way of a general consent may be used in subsequent research without further consent. This relieves the researcher of the need to re-contact the individual concerned. So long as the individual was fully informed and agreed to the future research application of his or her personal information or tissue, we are of the view that consent has been obtained, although the other ethical obligations (such as to require IRB review and to keep the information secure and confidential) will continue to apply. If the participant is also a patient, the consent-taking process must allow for the patient's dissent without prejudice to his or her treatment.

4.15 If personal information or tissue is to be stored or used in a form that allows an individual to be identified (rather than as de-identified material), then specific consent must be taken and it will be necessary to provide more detailed information to the individual at the time of consent-taking.

4.16 In summary, we are of the view that specific consent is required when research involves identifiable personal information or tissue samples. General consent may be obtained for subsequent unspecified research, subject to de-identification of the information and tissue as well as IRB review. Re-consent for future research is generally not necessary.

Recommendation 2: Specific consent should be obtained when research involves identifiable personal information or tissue samples. General consent may be obtained for subsequent research involving the use of de-identified information or remnant tissue. The information to be provided to the individual when taking consent should depend on the sensitivity of the information and the risk of harm.

Section B: Reciprocity, Disease Registries, Epidemiological Research and Public Health Research

4.17 Essentially, the consent requirement ensures that an individual's decision to participate in research by providing personal information (whether subsequently de-identified or not) is a free choice. However, the value of free choice does not supersede all other values in our society. Similarly, freedom from intrusion into

[11] Consent is legally valid whether it is in writing or not. However, putting consent in writing makes for easier resolution in the event of any dispute over whether consent was taken or what was consented to. It is generally desirable in research, where the researcher is the party requesting information or tissue samples. In the case of consent for clinical procedures, existing clinical procedures and conventions for taking consent will apply.

one's private life is not an absolute value. There are instances where other legitimate public interests take priority.

4.18 In our Human Stem Cell[12] and Genetic Testing and Genetic Research[13] reports, the guiding principles of 'justness' and 'sustainability' highlighted the need to respect the common good of both present and future generations, together with the importance of fair sharing of social costs and benefits. The reciprocity implied in these principles also applies in research; research depends on informed voluntary contributions or participation, and need not benefit the participants, though it benefits others in the future.

4.19 While it is generally accepted that the requirement of informed consent is important, as it acknowledges the principle of autonomy, there is growing recognition that this principle should not be strictly applied where important public interest may be served. Procedures for obtaining consent from research participants were considered in a UK report, in this case for the collection and retention of biological samples that could be used for genetic analysis.[14] The report recommended that consent procedures include notice to prospective research participants that:

> "(i) the medical treatment that all receive is based on studies carried out on very many earlier patients and that the request is for them to provide similar help for future generations;
>
> (ii) because medical science is changing very rapidly, some of the valuable uses to which the data could sooner or later be put are not foreseeable".

4.20 These recommendations entail the principle of reciprocity, the idea that accepting benefit from past medical research, inherent in the utilisation of medical services, carries some expectation of a willingness to participate in research for the common good or public interest. This is an especially important consideration in societies where individuals are seen incurring obligations to others through their membership and roles in society. In the wider public interest, therefore, we see the principles of autonomy and reciprocity as complementary.

4.21 There are many important uses of personal information that do not contribute directly to the healthcare of individuals, but are beneficial to society. These uses include epidemiological research,[15] public health protection requirements and health service management. We consider the use of medical records for health

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12 BAC (2002) *Ethical, Legal and Social Issues in Human Stem Cell Research, Reproductive and Therapeutic Cloning,* Chapter 7, paragraph 3.

13 BAC (2005) *Genetic Testing and Genetic Research*, paragraph 4.38.

14 House of Lords' Select Committee on Science and Technology, Fourth Report, *Human Genetic Databases: Challenges and Opportunities* (2001), paragraph 7.65.

15 Epidemiology is the study of the causes and distribution of diseases or epidemics in populations.

service management in Section C below. First, however, we focus on exceptional instances where personal information may be applied in biomedical research without the explicit consent of individuals concerned. These are typically certain types of biomedical research that are likely to promote public welfare without posing risk of serious harm to individuals concerned. Internationally, such research is gaining ethical endorsement under the principle of reciprocity.

Disease Registries

4.22 The National Disease Registries Office (NDRO) was established in 2001 as a department under the Health Promotion Board to manage and develop the Singapore Cancer Registry, the Singapore Renal Registry and the Singapore Stroke Registry. Apart from these registries managed by the NDRO, other disease registries in Singapore include the Singapore Myocardial Infarction Registry, the National Thalassaemia registry, the Singapore Myopia Registry and the National Birth Defects Registry. These registries collect patient information, analyse the data and report incidence and trends of diseases in Singapore. Their work is critical to sound public health policy formulation and programme planning, as well as for research in general. For example:

(a) A recent study on trends in cancer incidence in Singapore from 1968 to 2002 relied on data derived from the Singapore Cancer Registry and other sources. In the last 35 years several types of cancer have increased, but cancers of the stomach, liver, oesophagus and nasopharynx have declined substantially;[16]

(b) About 10,000 Singaporeans are admitted into hospitals for strokes and transient ischaemic attacks[17] every year, thereby making stroke the fourth leading cause of death;[18]

(c) Research using data drawn from the Singapore Myocardial Infarction Registry from 1988 through 1997 indicated that women who have heart attack tend to be older than men and are more likely to have prior ischaemic heart disease, atypical symptoms and worse prognosis than men if they are 64 years and below;[19] and

(d) In 2000, it was found that 47% of all new cases of end-stage kidney disease in Singapore were due to complications of diabetes, making

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16 *Trends in Cancer Incidence in Singapore 1968 – 2002*, A Seow, WP Koh, KS Chia, LM Shi, HP Lee, K Shanmugaratnam, Singapore Cancer Registry, Report No. 6, 2004.

17 A transient stroke lasting only a few minutes.

18 *Community-Based, Tri-Racial, Cross-Sectional Study on prevalence of Stroke among Chinese, Malay and Indian Singaporeans*, National Neuroscience Institute, Media Release, 27 April 2005.

19 "Gender Differences in Outcome After an Acute Myocardial Infarction in Singapore, R Kam, J Cutter, SK Chew, A Tan, S Emmanuel, KH Mak, CNS Chan, TH Koh, YL Lim, *Singapore Med J* 2002 Vol 43(5): 243-248.

Singapore the country with the second highest incidence of such cases of kidney failure in the world. This finding is important for devising preventive measures to halt the epidemic of kidney failure in Singapore.[20]

4.23 Not surprisingly, all major scientific countries have established disease registries. However, when many of these countries first implemented personal information protection regimes, a disproportionate emphasis was placed on the need to obtain specific consent from patients before information in their medical records could be disclosed by physicians to disease registries. In many of these countries, epidemiological research, as well as public health research, was severely affected. In Part III above, we have noted our concern in order to prevent a similar occurrence in Singapore.

4.24 Medical information is protected by medical confidentiality and may not ordinarily be disclosed without the consent of the patient concerned. However, it is important to understand that it is inappropriate to apply a strict informed consent requirement for every kind of biomedical research using medical information. The UK Academy of Medical Sciences clearly identified problems that can arise:[21]

(a) It may be impracticable to seek consent for a number of reasons, including temporal or geographical distance, and insupportable time and expense. Researchers have in the past analysed and linked thousands of medical records with data from other sources (including death records). These patients were not contacted for consent to use their information for research, and it would have been impossible to do so since many had died. However, confidentiality safeguards were observed so that the privacy interests of these patients were protected. Such research allowed the identification of risk factors for diseases, enabling preventive measures to be taken;

(b) Strict insistence on informed consent may compromise effective population coverage, which is critical for population studies and disease registries. If many people opt out, the data may no longer be representative, especially since higher refusal rates are common for certain segments of populations, such as the elderly or the socially disadvantaged. In such circumstances, a requirement for informed consent can lead to a significant diminution in the quality of the data, which may be rendered useless;

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[20] "Preventive Nephrology: A Time for Action", by A Vathsala and HK Yap, *Annals of the Academy of Medicine*, January 2005, Vol 34 No. 1, 1-2.

[21] *Personal data for public good: using health information in medical research* (January 2006), pages 58 to 61.

(c) Patients may be inconvenienced or distressed at being contacted for the use of their personal information in research. There are also patients who do not wish to dwell on a disease diagnosis or may be in denial;

(d) Bias in the research may arise if there is a significant or systematic difference between the proportion of individuals in different groups who consent to participate in the research. As suggested above, certain segments of populations may be more willing to give consent for research access to their personal information than others; and

(e) The reliability and generalisability of studies may be reduced, since a strict consent requirement will increase the cost of such studies, thereby leading to smaller study size and larger random errors. In some cases, consent may introduce unacceptable bias into the research findings and penalise some patients (such as schizophrenic patients).

4.25 As a matter of ethics, the use of medical information to secure or advance public health in a way that does not prejudice the patients concerned is an important practical expression of a principle of reciprocity. Existing patients are receiving the benefits of improved medical care through the contributions of past patients who have volunteered their medical information for research, and there is little ethical justification for them to refuse a similar contribution where their interest is not likely to be compromised. The principle of autonomy should not be applied rigidly, such that epidemiological and public health research directed at advancing the "common good" of improving medical care for future patients is hampered without good cause. Accordingly, we consider it to be ethically acceptable for medical information to be disclosed by physicians to disease registries provided that adequate privacy and other ethical safeguards that we have discussed in this Consultation Paper are in place, and that patients are appropriately informed. The essential principle is that the privacy interest of the patient should be primarily protected by appropriate privacy safeguards, rather than protected by the exercise of patient discretion in the use of information for the general good.

4.26 From the experience of scientifically advanced countries that share a common legal heritage with Singapore, we recognise that an ethical position on the disclosure of medical information for the purposes of important epidemiological and public health research may not be adequate in the absence of clear common law precedents, and legislative action may be required. Recently, the provision of medical information to a cancer registry for public health purposes became the subject of controversy in the UK. The question was whether the provision of medical information to such a registry and its subsequent use in research required patients' consent, and if it did, at what point and in what form. The main concern was the possibility that individuals might be identified. As a result, the UK Parliament had to introduce new legislative and regulatory guidelines in 2001 to put transfer of medical information to these registries on a sound legal

footing. Safeguards were proposed to ensure the anonymity of those on the registry to the fullest extent possible. These guidelines allow disclosure of personal information to the cancer registry and for the registry to use such information for biomedical research that serves a public interest, even without consent.

4.27 Similar developments have also been observed in the legal and regulatory landscapes of Australia and Canada, and in certain non-common law countries. For instance, the Swedish Personal Data Act (1998) provides that sensitive personal data may be processed for research and statistics purposes, even without the consent of patients, provided that the processing is necessary and that the interest of society is greater than the risk of improper violation of the integrity of the patients concerned. It further provides that research ethics committees or IRBs must approve the processing of personal information. Integral to this arrangement is that hospitals and custodians of personal information must consider privacy and confidentiality concerns before allowing access to personal information.

4.28 We generally consider these developments to be positive. In the past, it may have been acceptable for public healthcare institutions in Singapore to provide medical information to government entities for epidemiological or public health purposes. However, many healthcare institutions have been privatised in recent years and it has become unclear if government entities are able to require disclosure of personal information without the explicit consent of the patients concerned. In addition, legality of non-consensual disclosure of sensitive personal information to public health authorities for the protection of public health has long been recognised and provided for under the Infectious Diseases Act. Under this legislative regime, a physician, or indeed anyone who has reason to believe or to suspect that an individual is suffering from a specified infectious disease (such as the Severe Acute Respiratory Syndrome or SARS) or is a carrier of that disease, is required to notify the Director of Medical Services. While infectious diseases continue to be of grave concern to public health authorities, many more Singaporeans are today affected by conditions that are serious but not infectious, such as cancer, heart disease, renal disease and stroke. These conditions are the primary interest of disease registries, and they are of no less public health significance.

4.29 As such, we recommend that the relevant authorities consider adopting measures similar to those in the abovementioned countries, in order to enable the disclosure of personal information to public health entities (such as disease registries) within reasonable bounds and subject to reasonable safeguards. These measures should include mechanisms to allow the use of medical information in important public health research that poses minimal or no risk of harm to those concerned, in situations where it is impossible or impractical to obtain consent or if patients have previously objected to such research use.

Recommendation 3: We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to disease registries by health care institutions and physicians; and establish mechanisms enabling the registries and healthcare institutions to increase the accessibility of personal information for research that can significantly advance public welfare, while safeguarding privacy concerns.

Epidemiological Research and Public Health Research

4.30 Apart from medical information, other personal information held in public registries, such as the Registry of Births & Deaths, is also an invaluable resource for important biomedical research (typically epidemiological research). Disclosure of identifiable information held by public registries may be regulated by law (for example, in the case of information from the national census conducted by the Department of Statistics) or by in-house rules. Where disclosure of identifiable information by a public registry is permitted by law or regulation, the ethical principles of informed consent and confidentiality should apply in the same manner as they do for medical registries which include disease registries, custodians of medical records, and other similar registries of medical information.

4.31 The informed consent of individuals concerned is required before identifiable information about them may be used. In addition, if it is anticipated that such identifiable information would be shared with other researchers or used in other research, then the consent of the participant should reflect his or her agreement to such extended use.

4.32 However, this consent requirement should not apply to the use of reversibly de-identified information in epidemiological research and public health research. From an ethical perspective, it can be argued that reversibly de-identified information could be released from such registries for such research, provided that adequate de-identification and privacy safeguards are in place. Systems that nonetheless permit linkage of data do exist, such that information needed for research can be made available without prejudicing the privacy of the persons to whom the data relate. Some system of this kind is needed, because it may not be practical to require consent to be sought from the individuals concerned in every situation.

4.33 Important public health justification, with low risk of harm to individuals, has been considered in some jurisdictions to provide sufficient justification for the research use of personal information without the need to obtain informed consent. The types of research that typically qualify for such special treatment are epidemiological research and public health research, either of which may include the use of medical records. However, IRB review is still required and approval must be obtained from the custodian of the medical records (if used) as there are ethical and legal responsibilities in the proper management of these

records. In many of the scientifically advanced countries, legal mechanisms have been implemented to facilitate such use. For instance, in Australia and Sweden, ethics review committees are empowered to make such public interest valuation. Sections 60 and 61 of the UK Health and Social Care Act (UK HSC Act) were similarly enacted to mitigate the strict consent requirement.

4.34 Various mechanisms are possible to allow research access to personal information in ways that do not significantly compromise confidentiality and privacy concerns.[22] We consider the availability of such mechanisms to be beneficial to public welfare. While informed consent should generally be obtained for the research use of personal information, the procurement of consent may not be possible or practicable in every situation. There may be exceptional cases where important public health justification for certain research to proceed even where the consent requirement is not satisfied, if it poses minimal risk to individual privacy and confidentiality of personal information. These mechanisms may only be put in place through legislative means and we recommend that the relevant authorities consider establishing them.

Recommendation 4: We recommend that the relevant authorities consider establishing legal mechanisms to facilitate the use of personal information in registries, databases and medical records for epidemiological research and public health research. These mechanisms should also ensure that there is minimal risk to individual privacy and confidentiality.

Section C: Clinical Audit and the Electronic Medical Record Exchange

4.35 Broadly speaking, clinical audits are activities carried out by physicians or healthcare institutions to monitor and evaluate or to otherwise improve the quality and appropriateness of the medical services provided and the practices and procedures carried out by them. These activities can also be undertaken to identify and resolve problems that may have arisen in connection with such services, practices or procedures, and may entail access to the medical records of patients.

4.36 These records are likely to be increasingly electronic in nature. The Electronic Medical Record Exchange (EMRX) is an initiative of the Ministry of Health (MOH) and the two healthcare clusters – Singapore Health Services and National Healthcare Group – to facilitate the sharing of electronic medical records among public hospitals and polyclinics in Singapore. In 2004, the MOH commenced its first phase of implementation with the sharing of the Hospital Inpatient Discharge Summary.

[22] The ethical requirement of privacy and confidentiality safeguards is discussed in Part VI below.

4.37 The MOH has identified the benefits of the EMRX to be:

(a) improvement to the quality of care provided;

(b) increase in safety, since patients' drug allergies and current medications will be readily accessible to attending physicians; and

(c) reduction to medical cost, as physicians can now view the results of any recent blood tests, X-rays and investigations online without having the need to repeat such tests.

4.38 These benefits are clearly relevant to clinical audit. Although the facilitation of clinical audit is not given as an advantage of EMRX, it is unlikely that effective audit can proceed without some use of it. Currently, only physicians and healthcare staff involved in the care of a patient have access to medical information in the EMRX and information protection safeguards have been implemented.

4.39 The Ministry of Health does not currently permit research access to information in the EMRX. However, medical information in the EMRX may be a potential source of personal information for research. If research access were to be considered, the ethical principles of informed consent and confidentiality would apply.

4.40 Physicians may at times wish to use the medical records of their own patients to review the quality and effectiveness of their clinical services, to determine any new trends, or to study the diseases of their patients. They may subsequently publish their findings, which should not include any identifiable patient information. This anonymity is also required by journal editors. Although such use of medical information does not directly or necessarily benefit the patients whose records are reviewed, it is not so different an application that it should require patients to provide explicit consent. Moreover, the privacy interest of patients is not compromised as there is no disclosure to third parties. We consider such clinical reviews as extensions of medical care and hence ethically desirable. Such work, whether published or unpublished, need not fall within the remit of an IRB.

4.41 Section 11 of the Private Hospitals and Medical Clinics Act provides a mechanism for the conduct of clinical audit by quality assurance committees. While the provision does not explicitly address the issue of medical confidentiality, it is implicit that the use of medical information for clinical audit by such a committee, within the confines of a healthcare institution, does not amount to inappropriate disclosure of medical information.

4.42 However, it is legally unclear whether those who are not members of the quality assurance committee may be involved in such audit activities without the

explicit consent of the patients concerned. While we do not consider clinical audit to be ethically contentious when carried out in a limited context that poses minimal risk to individuals concerned, the scope of clinical audit has greatly expanded in many leading scientific jurisdictions. Under an expanded clinical audit, other healthcare and non-healthcare professionals can be involved in reviewing medical information.

4.43 From the experience of these countries, there is reason to believe that such expanded clinical audit can significantly advance public interest by improving the quality of healthcare services provided. Steps have been taken in these countries to effectively allow the use of personal information for clinical audit, notably under the UK HSC Act, although subject to credible safeguards. This removes any concern that such application of personal information will be in violation of medical confidentiality and provides assurance to the public that privacy and confidentiality interests in personal information will be safeguarded. We recommend that the relevant authorities consider taking similar legal steps to provide public assurance that privacy and confidentiality interests in personal information will be safeguarded.

Recommendation 5: We recommend that the relevant authorities consider legal provisions necessary to ensure that the potentially increased scope of clinical audit does not violate medical confidentiality and to assure the public that privacy and confidentiality interests in personal information will be safeguarded.

Section D: Additional Considerations about Consent

Vulnerable persons

4.44 Vulnerability may be thought to occur if an individual's ability to give informed and voluntary consent is compromised or if he or she would be at heightened risk for adverse consequences of the research. In our Genetic Testing and Genetic Research Report[23] we identified three common categories of vulnerable persons, namely:

(a) children and adolescents;

(b) the mentally impaired; and

(c) persons in dependent relationships: such persons include but are not limited to students, junior research assistants, medical or paramedical staff, personnel under military discipline, or prisoners.

[23] BAC (2005) *Genetic Testing and Genetic Research*, paragraphs 4.8 – 4.18, pages 25-28.

4.45 Vulnerable persons raise particular ethical issues in research, especially where consent is concerned. This is because their interests must be considered, if necessary by proxy, and their participation sought only when other research participants are unavailable or unsuitable.

4.46 Where personal information is concerned, it is our view that individuals in these categories are entitled, as a general rule, to the same considerations of privacy and protection as any other research participants.

4.47 In the case of children and adolescents, and still more in the case of infants, much of their personal information is naturally known to parents or guardians. It is the responsibility of researchers to ensure on the one hand that parents or guardians are appropriately informed when consent for their children to participate in research is sought, and on the other that children or adolescents are also informed and their consent sought, in a manner appropriate to their level of maturity. We reiterate that persons responsible for the care of children and adolescents should only act in the best interest of the latter. This "best interest" principle also applies when such a person is to provide informed consent on behalf of a child or an adolescent for the use of his or her personal information in research. In any case, personal information relating to children should be accorded the same privacy protection by researchers, as would be granted to information from any consenting adult.

4.48 In the case of mentally impaired persons, a similar principle applies. Consent to participate in research may be managed by persons in a position of legal guardianship, who are obligated to consider the best interest of such persons in their care. In any event the research participant should be involved as far as possible in the decision process, and enjoy the same privacy rights with respect to personal information as any consenting adult of sound mind.

4.49 In the case of dependent persons, it is important to avoid situations where a potential research participant might feel obligated to participate. For example, serving National Servicemen may feel obliged to give consent to those with authority over them. Similarly, it might be wise for researchers not to rely on their own research staff or students to serve as participants. Notwithstanding considerations of consent, however, we again stress that personal information from dependent participants should enjoy the same protection as that of any other participant.

4.50 We are therefore of the view that IRBs when reviewing research proposals should take note of cases where participants might appear to be vulnerable, and satisfy themselves that any concerns are appropriately addressed.

Recommendation 6: We recommend that IRBs, when reviewing research, ensure that any concerns in regard to vulnerable persons are appropriately addressed.

Withdrawal of Consent

4.51 Regardless of how a research participant is involved (whether in the provision of tissue, personal information or other forms of involvement), he or she should be able to withdraw consent to participate at any point. Researchers should assure potential participants that no reason need to be given for withdrawing consent and that such decisions will not compromise the quality of any care or entitlements that might be given to them or their families, where applicable.

4.52 When consent is being obtained, a research participant should be informed that, in the event he or she withdraws consent, the personal information and/or tissue samples provided will either be destroyed or irreversibly de-identified, so that it will not be possible to identify him or her. Such withdrawal does not affect completed research or tissue that has been used.

Recommendation 7: Research participants should be allowed to withdraw their consent to participate in a research at any time without explanation and without prejudice. They should be assured that upon withdrawal their personal information and/or tissue samples will either be destroyed or irreversibly de-identified.

V. Privacy and Confidentiality

5.1 Personal information that is used in biomedical research is often held in databases. Most researchers will have a database, in the sense of having a system to store and access the data collected in the research, including any personal information. When a database is large, accessed by many researchers, contains particularly sensitive information, or is to be linked with other databases, ethical considerations of data protection become more pressing.

5.2 It is not our intention to specify particular means by which such databases may be established or managed. Indeed, we recognise the importance of diversity in research databases, and such diversity necessitates different approaches to their creation and operation. However, we suggest that IRBs note and approve data management arrangements, taking into account these principles as applicable:

(a) A procedure should be available for research participants to obtain information, make inquiries and withdraw their consent to participate in the research;

(b) Safeguards should be in place to ensure that there is no inappropriate or unauthorised access to information in the database, and to ensure authenticity of the information;

(c) Depending on the sensitivity of the information or research concerned, a record may need to be kept of who has accessed information in the database and when;

(d) Procedures should be stated for re-contacting research participants or others such as relatives, if necessary;

(e) Procedures should be stated for obtaining consent related to deceased or incompetent participants, or for obtaining any information for which consent is not required, if appropriate;

(f) Research results using information or material from the database should not be published in a form that permits identification of individuals without consent;

(g) There should be proper limits established to any family contact, and the role of the participant's attending physician, if any, should also be clearly established if relevant; and

(h) Research participants should understand, when consenting to participate, the extent and nature of any feedback that they might expect to get on the results of the research as it progresses, and that they can refuse such feedback.

5.3 Insurance companies and employers should not have access to personal information in a research database. Research data is not obtained with the aim of providing research participants with specific information about their health status. Research data is of little value to insurance companies and employers, and may be misleading when used outside the research context. In addition, other sensitive information may be derived from research data, such as information about paternity or about the presence of heritable conditions. Researchers have an obligation to protect the privacy of research participants and other third parties such as the close genetic relatives of the participants, and to ensure the confidentiality of all information derived from the research. Issues concerning access to medical information by insurers and employers are further discussed in Part VI below.

5.4 When it is necessary for identifiable personal information to be disclosed due to compulsion by law or other public interest requirements, the research participant should be informed as soon as possible so that he or she may have the opportunity to challenge such compulsion.

5.5 It is the responsibility of researchers to prevent breaches of privacy in respect of personal information in their control or possession. A researcher will normally have access to personal information when it is collected from individuals who have agreed to participate in the research. Even though it is ethically proper for

the researcher to hold personal information for purposes covered by the consent, personal information should be de-identified as far and as early as possible in the information management process. In particular, the storage and transfer of personal information should be effected as de-identified information whenever possible.

Recommendation 8: Personal information should be de-identified as far and as early as possible and should be stored or transferred as de-identified information.

5.6 Researchers should ensure that personal information is protected by security safeguards appropriate to the sensitivity of the information and the risk of harm, actual or perceived. These safeguards should protect against loss or theft, as well as unauthorised access, disclosure, copying, use and modification. The degree and extent of safeguards should generally be proportionate to the sensitivity of the information held and the potential consequences that may arise from any inadvertent disclosure. Security safeguards should be comprehensive in proportion to the scale of the research when sensitive personal information is involved.

5.7 All researchers should respect the privacy of individuals concerned and not attempt to identify an individual from the de-identified information. A researcher accessing a de-identified database has no direct contact with and is unaware of the identity of the individuals contributing to the database. In the event that the researcher becomes aware of the identities of these individuals, whether through having access to a code by which information can be re-identified or through other means, the researcher is obliged to safeguard the confidentiality of the information.

Recommendation 9: Researchers should not attempt to identify an individual from de-identified information as it is a serious breach of ethics to do so.

5.8 Biomedical research that uses personal information (other than information that is irreversibly de-identified), or information that is not already in the public domain, must be approved by an IRB. If a personal information protection regime is established in Singapore (as per Recommendation 1), this requirement should be included.

5.9 There appears to be a consensus that irreversibly de-identified information should not fall within the purview of personal information protection regimes in countries that have such a regime. Since the information has been irrecoverably de-identified, the risks of privacy and confidentiality violations have been removed.

5.10 However, legal scholars and ethicists have both indicated that even if de-identification is usually adequate to safeguard the privacy interest of research participants, there may be circumstances when it fails to do so. For instance, de-

identification may not sufficiently protect the privacy interest of those affected by diseases that are typically found in only identifiable groups of people, such as Tay-Sachs disease in Ashkenazi Jews or sickle cell anaemia in people of African descent. The effectiveness of de-identification may also be limited in small and close knit populations, if extensive information is collected. If it proves possible to identify an individual from irreversibly de-identified data, researchers should comply with the spirit of this Consultation Paper, and take all possible measures to protect the privacy of the individual in such cases.

5.11 In general, however, we agree with the position that irreversibly de-identified personal information should not be subject to privacy and confidentiality requirements. In most cases, such information may be treated in the same manner as information in the public domain.

Recommendation 10: Irreversibly de-identified personal information generally need not be subject to privacy and confidentiality requirements.

5.12 For reversibly de-identified information, it is far less clear if such information should still be regarded as personal information. Leading scientific jurisdictions are still working towards a resolution. One of the key ethical issues is the extent of de-identification that is required before research information is considered to fall outside of privacy and confidentiality requirements. For some biomedical research, follow up data from the same individual is needed. Hence, reversibly de-identified information is required.

5.13 Research information that is reversibly de-identified should not attract the same legal and ethical obligations that attach to identifiable information. As technology advances, it may be harder to ensure confidentiality in reversibly de-identified information, short of irreversibly de-identifying the information. The extent of de-identification needed is a matter of proportion, so that effectiveness of de-identification should be balanced against the level of sensitivity of the information and the likely harm that would follow in the event that an individual is identified. Since research involving reversibly de-identified information must be subject to IRB approval, it is the responsibility of the IRB to consider the proportionality of de-identification proposed.

Recommendation 11: When reversibly de-identified information is used for research, IRBs should consider the adequacy of the extent and means of the de-identification in proportion to the risk. Should a person be identified from de-identified information, the person should still enjoy confidentiality and privacy entitlements.

5.14 Once identifiable information is procured, it is the responsibility of researchers to ensure its confidentiality. We have discussed various confidentiality considerations above. These considerations include the storage of personal information as reversibly de-identified information and only de-identified

information should be transmitted whenever possible. Accordingly, even if a researcher has obtained the informed consent from a research participant to hold personal information about him or her, it would be prudent for the researcher to store the information in such a manner that the complete personal profile of the research participant is not readily accessible. For instance, the researcher may want to maintain a system of de-identification through separate storage of medical information and identifying information of the research participants or by having the link between the codes held by an independent third party. We emphasise that the level of confidentiality safeguards, whether in the extent of de-identification or otherwise, should be commensurate with the potential risk to research participants. In addition, researchers must comply with all regulatory requirements governing the confidentiality of information received from medical or public registries.[24]

5.15 Generally, the confidentiality obligation of research institutions involved in large-scale research initiatives will be more wide-ranging than research performed by a single researcher. For example, certain large-scale research initiatives involve a system of de-identification to secure the confidentiality interest of research participants. This system ensures that separate custody arrangements are made for different aspects of medical information, tissue samples and other personal information collected from research participants.

5.16 When such a scheme is properly operated, it is possible to link various items of personal data for research purposes, but there is no linkage to specific individuals. The latter would require the approval of an IRB and an oversight committee, which should be independent of the sponsoring institution, to override the system. Researchers would of course have to comply with all regulatory requirements governing the confidentiality of information received from medical or public registries pursuant to such schemes.

Recommendation 12: The ethical principle of confidentiality should apply to the use of personal information from medical or public registries. Confidentiality safeguards should be commensurate with the potential risk of harm from inadvertent disclosure.

VI. Access to Medical Information by Insurers and Employers

6.1 Personal information should not be disclosed to a third party without the individual's consent. However, there are circumstances where a person may be required to make available his or her personal information in order to obtain access to certain economic, political or social goods. The possibility and extent of access to personal information by third parties is very relevant to public confidence in the capability of existing institutions to safeguard the interest and

[24] Medical registries and public registries have been discussed in Section B of Part V above.

welfare of individuals. In this Consultation Paper, we focus on access for two main non-therapeutic and non-research purposes: obtaining employment and obtaining insurance coverage.

Employment

6.2 An employer is reasonably entitled to ensure that a prospective employee is able to meet the requirements of the job by virtue of good health, either before or during employment. Many employers in Singapore do take into account the health status of job applicants, particularly if they provide employees with some measure of health insurance.

6.3 Employers will often arrange for prospective employees to undergo a medical examination with the understanding that acceptance to employment is subject to satisfactory medical examination. Pre-employment medical examination is considered acceptable so long as the information derived from the examination is relevant to the nature of the job that the prospective employee is expected to undertake. However, the usual ethical obligations attending medical information apply even though such information is not held by an employer for the purposes of health care provision or biomedical research. Once an employee leaves the employment, or if an employer declines to employ an applicant, the relevant medical reports should be carefully disposed of by the employer within a reasonable time.

6.4 Employers may also carry out more specific types of medical test on applicants or employees. For instance, employers may seek to conduct tests to reduce workers' compensation claims, to meet occupational health and safety obligations, or to increase productivity, by screening out employees who are most likely to be absent from work due to illness. In addition, the testing could potentially take the form of predictive genetic testing in an attempt to identify if an individual who is currently asymptomatic has a genetic profile that increases the likelihood that he or she will develop a disorder as a result of the workplace environment.

6.5 Predictive health testing of any kind, whether genetic or not, depends heavily on the validity of the tests as predictors, the level of probability associated with any prediction, and the nature of the effects of the disease or disorder. As gene technology is still very much in its infancy, there is often a high level of uncertainty in the predictive value of genetic information. We are concerned that potential employers may discriminate on this basis. Even for monogenic diseases, it is usually not possible to predict the severity or time of onset of the disease in question and there is the possibility that the disease may not even manifest itself during the working life of the individual.

6.6 An employer may not arbitrarily discriminate against a prospective employee on irrelevant grounds without ethical compromise. This issue can arise if employers discriminate on grounds of age, gender, race or religion, for example. In general we take the view that merit in the form of ability to do the job is the important criterion. In a similar way, discrimination based on the possibility of developing late-onset health problems, or on relatively irrelevant or minor health grounds, would be difficult to defend. However, a measurable and real impairment of ability, at the time of application or soon thereafter, incurs a cost on an employer, and may entail a risk to the employee or to the public.

6.7 We are of the view that genetic testing should not be part of pre-employment medical examination. However, we agree that the use of valid genetic or other health testing by employers is appropriate to address imminent health and safety concerns, or where the detected or predicted condition is incompatible with the requirements of the job, especially insofar as these affect third parties.

Insurance

6.8 In order to obtain life and health insurance, a person may be asked to provide detailed information about his or her health, the health of his or her parents and siblings, and certain lifestyle information such as smoking and drinking habits. A person may also be required to undergo a medical examination. The possibility of including predictive genetic test results as part of this information has surfaced as a concern in several jurisdictions.

6.9 There are costs to an insurance company if it is denied relevant health or medical information, genetic or otherwise. These costs are born by other policy holders. A system of national insurance can absorb this cost in the public interest of avoiding an uninsured population, but private insurers are not obviously under any obligation of this nature.

6.10 Concealing relevant information to which an insurance company is entitled may void a policy. If the insurance company is not entitled to the information but the policy applicant has it, an 'adverse selection' situation is created. On the other hand, it is not in the public interest, that individuals become reluctant to undergo necessary genetic or other health testing for fear of having to disclose the results. If this were to occur, both the ability of physicians to provide the best health care to patients and the potential benefits of biomedical research could be reduced.

6.11 There is no clear solution to the question of whether the insurance industry should have access to predictive genetic test results, because the interests of insurance companies and the interests of insured parties do not coincide, and because the predictive and actuarial value of genetic tests is often unclear. It may be the case that the actual risk of real loss to companies is quite small and

difficult to predict. There is however general consensus that no one should be compelled to undergo genetic testing in order to obtain insurance coverage.

6.12 We recognise the potential adverse selection problem that may arise as a result of inequality of information and that risk evaluation for the purposes of determining insurance coverage involves discriminating between applicants. However, we empathise with the public's concern of possible discrimination in the availability of insurance coverage.

6.13 A detailed review was undertaken by the UK House of Commons' Select Committee on Science and Technology in 2001. The Select Committee recommended that the Genetics and Insurance Committee (GAIC), a non-statutory advisory public body, closely monitor the situation to ensure that the insurance industry only made use of genetic test results approved by the GAIC.

6.14 Following the recommendations of the Select Committee, a moratorium was implemented by agreement between the UK Government and the Association of British Insurers from 2001. Under the moratorium, a person will not be required to disclose the result of a predictive genetic test unless approved by the GAIC (to date, only Huntington's Disease has been approved) and is for coverage of more than £500,000 of life insurance or £300,000 for critical illness insurance or income protection insurance with annual benefits of £30,000. The initial duration of the moratorium was 5 years and was later extended for another 5 years, to 2011.

6.15 We are of the view that a similar moratorium on the use of predictive genetic information could be considered in Singapore. This will allow both the insurance industry and relevant government authorities time to look into the substantive issues. Both parties should ensure that only relevant and reliable information is used in assessing insurance applications, and that the outcomes of the conditions considered are both serious and predictable, before considering lifting any such moratorium.

Recommendation 13: We recommend that the government consider implementing a moratorium on the use of predictive genetic information for insurance purposes and appoint an authority to consider long-term implications of the accessibility of predictive genetic test results by employers and the insurance industry and to monitor developments in this area.

Consultation Paper on "The Use of Personal Information in Biomedical Research" (14 June 2006)

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49. Singapore Association of Social Workers
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51. Singapore Chinese Buddhist Association
52. Singapore Cord Blood Bank
53. Singapore Dental Association
54. Singapore General Hospital
55. Singapore Medical Association
56. Singapore Medical Council
57. Singapore National Academy of Science
58. Singapore National Employers Federation
59. Singapore National Eye Centre
60. Singapore Nurses Association
61. Singapore Nursing Board
62. Singapore Tissue Network
63. Society of Bioscience & Technology
64. The Spiritual Assembly of the Bahá'is of Singapore
65. StemCord Private Limited
66. Tan Tock Seng Hospital
67. Taoist Mission (Singapore)
68. Thomson Medical Centre
69. Vanda Pharmaceuticals
70. Zoroastrian Association of Singapore

Written Responses to the Consultation Paper on "The Use of Personal Information in Biomedical Research"

1. College of Family Physicians Singapore
2. Department of Community, Occupational and Family Medicine, Yong Loo Lin School of Medicine, National University of Singapore
3. KK Women's and Children's Hospital
4. The Law Society of Singapore
5. Life Insurance Association of Singapore
6. Majlis Ugama Islam Singapura (Islamic Religious Council of Singapore)
7. Ministry of Information, Communications and the Arts (Private Communication)
8. National Cancer Centre
9. National Council of Churches of Singapore
10. National Dental Centre (Private Communication)
11. National Healthcare Group Research Ethics Committee (Private Communication)
12. National Medical Ethics Committee
13. National Skin Centre
14. NUH-NUS Tissue Repository
15. Office of Life Sciences, National University of Singapore
16. Parkway Hospitals Singapore Pte Ltd
17. Raffles Hospital
18. The Singapore Chinese Buddhist Association
19. Singapore Medical Association
20. Singapore Medical Council
21. Singapore Nursing Board
22. SingHealth IRBs
23. Society of Bioscience & Technology
24. StemCord Private Limited
25. Tan Tock Seng Hospital

College of Family Physicians Singapore

8 August 2006

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Dear A/Prof Kaan

Feedback on Consultation Paper

Thank you for inviting the College of Family Physicians Singapore to comment on the consultation paper "The Use of Personal Information in Biomedical Research".

The College supports the recommendations suggested in the paper and acknowledges the great effort put forth by the Bioethics Advisory Committee in consolidating the research.

Thank you.

Yours sincerely,

A/Prof Goh Lee Gan
President
20th Council (2005 - 2007)

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Feedback to the Bioethics Advisory Committee (BAC), Singapore,

From the Department of Community, Occupational and Family Medicine, Yong Loo Lin School of Medicine, National University of Singapore
for the 14 June 2006 Consultation Paper entitled
"The Use of Personal Information in Biomedical Research"

	BAC's Recommendation	**COFM Response**
1.	*The Legal Protection of Personal Information* We recommend that the relevant authorities consider establishing a legal framework for the use of personal information in biomedical research.	Yes, we support this. It helps assure research participants that they are protected by a legal framework, on top of good practices and policies set out by Institutional Review Boards (IRBs) and the individual Principal Investigators (PIs). It also reinforces that biomedical research is for public good and not merely for scientific progress. Our concerns regarding this recommendation are: • The legal framework must not be too cumbersome and restrictive so as to balance protection versus research needs. • The legal framework should be broad and yet robust to remain relevant for the rapidly advancing field of biomedical science and the supporting or driving technology. It should take into consideration new technology e.g. Trusted Third Party (TTP) / Data Privacy Framework (DPF) mechanisms.
2.	*Consent and Proportionality* Specific consent should be obtained when research	Yes, we support this.

	BAC's Recommendation	**COFM Response**
	involves identifiable personal information or tissue samples. General consent may be obtained for subsequent research involving the use of de-identified information or remnant tissue. The information to be provided to the individual when taking consent should depend on the sensitivity of the information and the risk of harm.	We agree that the level of details in the consent form must be in proportion to the risk of harm to research participant. For example in a very low-risk procedure like taking blood pressure, it is not normal practice to explain beforehand to the participant about the slight discomfort that he will experience when the cuff is being inflated.. We also must have clear statements to cover legacy issues pertaining to studies, data, tissues, etc collected in earlier studies. While getting re-consent would be impractical, IRB review and approval would still be required.
3.	*Disease Registries* We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to disease registries by health care institutions and physicians; and establish mechanisms enabling the registries and healthcare institutions to increase the accessibility of personal information for research that can significantly advance public welfare, while safeguarding privacy concerns.	Yes, we support this. We would like to emphasize the need for legislation to allow access for research and suggest that legislation be restricted to research for policy and health planning. Our concerns regarding this recommendation are: Trying to get an omnibus Bill/Act to cover all possible disease registries would be too complicated and confusing. It may be preferable to go for disease-specific registries e.g. Cancer Registry, with all the proper justifications, procedures and safeguards. An alternative would be to have a very general Act, and leave the disease-specific details to the Regulations. We should try to expedite the enactment of such legislation as it is long overdue and urgently required to prevent the collapse of present registries. It would be extremely difficult to re-start a comprehensive population-based registry e.g. the Cancer Registry.

	BAC's Recommendation	COFM Response
4.	*Epidemiological Research and Public Health Research* We recommend that the relevant authorities consider establishing legal mechanisms to facilitate the use of personal information in registries, databases and medical records for epidemiological research and public health research. These mechanisms should also ensure that there is minimal risk to individual privacy and confidentiality.	Yes, we support this. Provisions for a TTP/DPF should be a key platform for privacy protection. We are concerned that as the legal mechanisms become formalised, extra costs will be incurred as a result of added administrative overheads and IT requirements. We foresee the need to adjust manpower funding (especially for small projects) for the overhead needed to comply with the legal mechanisms. We hope that funding agencies will provide for administrative support to the Principal Investigators to adhere to the legal mechanisms.
5.	*Clinical Audit and the Electronic Medical Record Exchange* We recommend that the relevant authorities consider legal provisions necessary to ensure that the potentially increased scope of clinical audit does not violate medical confidentiality and to assure the public that privacy and confidentiality interests in personal information will be safeguarded.	Yes, we support this. We understand that clinical audit is not considered research and the use of medical records in such activities is presently not subject to IRB review.
6.	*Vulnerable persons* We recommend that IRBs, when reviewing research, ensure that any concerns in regard to vulnerable persons	Yes, we support this. The Act must define "vulnerable persons".

	BAC's Recommendation	COFM Response
	are appropriately addressed.	
7.	*Withdrawal of Consent* Research participants should be allowed to withdraw their consent to participate in a research at any time without explanation and without prejudice. They should be assured that upon withdrawal their personal information and/or tissue samples will either be destroyed or irreversibly de-identified.	Yes, we support this. Participants must be given the choice either to have all data and tissues destroyed or irreversibly de-identified upon withdrawal. It should not be left open to the Principal Investigator's decision. At the same time, from our experience, we recognise that there can be several types of withdrawals e.g.: • Please don't contact me again. You can use all my data and samples that you have collected over the past 10 years. • Please don't contact me again. Please also destroy all my data and samples that you have collected so far. Provision should be made to cater for these different levels of withdrawal e.g. IRB to set guidelines for more complex cases of participant withdrawal.
8.	*Privacy and Confidentiality* Personal information should be de-identified as far and as early as possible and should be stored or transferred as de-identified information.	There are scientifically valid reasons for a research participant to be re-contacted or identified for the purpose of follow up or conducting longitudinal studies, such as in certain types of epidemiological research. In the current practice, the research participant would be asked for consent for follow up or re-contact after having been adequately informed of the implications. We strongly agree that the research participant's information/tissues need to be de-identified for privacy reasons, but irreversibly de-identifying these would disable research of the nature described.

	BAC's Recommendation	COFM Response
		At the same time, we recognize that there are some cases where irreversible de-identification would be appropriate and would not hamper the research process. For sensitive topics e.g. HIV/AIDs, this may be assuring for IRBs and for research participants. It would be better for Recommendation 8 to be suffixed with "The de-identification process should be made reversible or irreversible, depending on which best serves research participants' interests and research needs.
9.	Researchers should not attempt to identify an individual from de-identified information as it is a serious breach of ethics to do so.	For the same reasons stated earlier, we suggest that this recommendation be modified to "Researchers should not attempt to identify an individual from de-identified information unless there is proper justification to do so and the action is approved by the IRB".
10.	Irreversibly de-identified personal information generally need not be subject to privacy and confidentiality requirements.	Yes, we support this.
11.	When reversibly de-identified information is used for research, IRBs should consider the adequacy of the extent and means of the de-identification in proportion to the risk. Should a person be identified from de-identified information, the person should still enjoy confidentiality and privacy entitlements.	Yes, we support this.

	BAC's Recommendation	COFM Response
12.	The ethical principle of confidentiality should apply to the use of personal information from medical or public registries. Confidentiality safeguards should be commensurate with the potential risk of harm from inadvertent disclosure.	Yes, we support this.
13.	*Insurance* We recommend that the government consider implementing a moratorium on the use of predictive genetic information for insurance purposes and appoint an authority to consider long-term implications of the accessibility of predictive genetic test results by employers and the insurance industry and to monitor developments in this area.	Yes, we support this.
-	Other comments,	Information/tissue that potentially identifies an individual and will be sent to or received from overseas, must have approval from the relevant authorities. For research purposes, the IRB and Head of Institution must give their written approvals. The IRB, in its review, must also consider the mode of transmission of the information and ensure sufficient measures to ensure the safety of the information during transfer.
-	In conclusion: …	We are pleased to read the consultation paper that has been put together by the BAC on the

	BAC's Recommendation	COFM Response
		use of personal information in biomedical research. We are glad that many of the recommendations are already in place and implemented by us in the various population-based epidemiological studies that we have been conducting thus far in the department. This paper will help inform the public that researchers, in general, are aware and compliant with good practices in maintaining data confidentiality and privacy of personal information, and provide a vote of confidence in the high standard of research integrity maintained by researchers at large. While we applaud and support the detailed recommendations which have comprehensively covered many aspects in the use of personal information in biomedical research, we hope that the legal mechanisms can be streamlined to be both efficient and cost-effective for researchers. In particular, we are concerned that the need for a third party in providing the linkage of databases may necessitate a cost that needs to be provided for through grants. This may be problematic for small-scale studies that may not have the budget for the administrative cost incurred in this process. We are also concerned about the accessibility of identifiable information for the practicality of conducting long-term follow-up studies. Hence, we hope that while Principal Investigators adhere strictly to the use of escrow systems and data confidentiality, they will be allowed to have access to identifiable information when it is necessary for conducting the follow-up of individual research participants. Finally, while linkage is often done through the use of the NRIC, mistakes in data entry may lead to inaccuracies of linkage. Hence,

	BAC's Recommendation	**COFM Response**
		Principal Investigators should also be allowed to have sufficient information provided with the linkage, such as gender and birthdates in both databases, to verify the accuracy of the linkage.

This feedback is submitted through:

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12 July 2006

Assoc Professor Terry Kaan
Chairman
Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way
#10-12 Helios
Singapore 138667

Dear Terry

REQUEST FOR FEEDBACK ON CONSULTATION PAPER

I refer to your letter dated 14 June 2006. We congratulate you for an excellent paper which was well written and comprehensive. We feel that this is a very timely paper covering all aspects of the use of personal information in biomedical research.

In principal, we agree with all the 13 recommendations and we would like to provide some feedback as appended overleaf.

Terry, we hope our feedback will be useful and please feel free to correspond with us if any clarification is required.

With warmest regards

Yours sincerely

A/Prof Tay Eng Hseon
Chairman Medical Board

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FEEDBACK ON CONSULTATION PAPER
"THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH"

We seek clarification as to what 'relevant authorities' refer to (1), (3), (4) & (5).

Is it members of hospitals. If hospitals, do we in KKH have the resource to establish a legal framework to carry out our ethical duties. Will there be many versions if each institutions establishes their own legal framework.

It is also not very clearly defined what made anonymised (i.e. to de-identify with the potential of re-identification later if necessary) and what made anonymous (i.e. to de-identify such that there can be no link ever of personal information to the person) is. Under what circumstances is fully anonymous data called for?

The protection of data is not sufficiently spelt out. Is it the PI's sole responsibilities? Where and under what securities should the data base be sited.

Part IV Para 10.

We feel that it is imperative what identity is "delinked"

Part IV Recommendation 2

For tissue samples, we are of the view that generally, de-identification should be irreversible, unless it address the treatment of disease and with consent from patients.

Our Ref: LS/85/06/CLT/dy Your Ref:

THE LAW SOCIETY OF SINGAPORE

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26 July 2006

Assoc. Professor Terry Kaan
Chairman
Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way
#10-12 Helios
Singapore 138667

Dear Sir

REQUEST FOR FEEDBACK ON CONSULTATION PAPER

Further to our letter dated 22 June 2006, the Society appointed an ad hoc committee to review the consultation paper by BAC titled "The Use of Personal Information in Biomedical Research".

We are pleased to enclose our ad hoc committee's feedback on the matter for your consideration.

Thank you for giving the Society the opportunity to give our views on the matter.

Yours faithfully

Chua Lik Teng
Deputy Chief Executive Officer

enc./

26 JULY 2006

THE LAW SOCIETY OF SINGAPORE

AD HOC COMMITTEE'S FEEDBACK ON THE BIOETHICS ADVISORY COMMITTEE'S CONSULTATION PAPER ON THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

THE LAW SOCIETY
OF SINGAPORE

THE LAW SOCIETY OF SINGAPORE

AD HOC COMMITTEE'S FEEDBACK ON THE BIOETHICS ADVISORY COMMITTEE'S CONSULTATION PAPER ON THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

INTRODUCTION

The Law Society appointed an ad hoc committee (the "Committee") to conduct the review of the Consultation Paper by the Bioethics Advisory Committee ("BAC") on "The Use of Personal Information in Biomedical Research". This Committee comprises practitioners involved in advising and representing individuals and organisations in the health care industry as part of their legal work, who have also been involved in the review of an earlier consultation paper by BAC in April 2005.

In this review, the Committee's comments are limited to the legal aspects of the Consultation Paper based on the current law in Singapore.

The views of the Committee are set out as follows.

COMMENTS OF AD HOC COMMITTEE

1. The Committee agrees, in general, with the recommendations of the BAC, save for comments on the following points. We have addressed issues in the order in which they appear as recommendations in the Consultation Paper.

RECOMMENDATION 2

Specific consent should be obtained when research involves identifiable personal information or tissue samples. General consent may be obtained for subsequent research involving the use of de-identified information or remnant tissue. The information to be provided to the individual when taking consent should depend on the sensitivity of the information and the risk of harm.

2. Recommendation 2 recommends that specific consent should be obtained where research involves identifiable personal information or tissue samples. However, in respect of de-identified information or remnant tissue, the recommendation is that general consent may (as opposed to "should") be obtained.

3. Whilst we agree that general consent would be sufficient in the case of de-identified tissue and remnant tissue, the use of the word "may" suggests that the researcher has an option to obtain consent. We are of the view that the recommendation should be that general consent should (rather than "may") be obtained, as the participant's consent at the time would not have encompassed the subsequent use of the information or remnant tissue and it is conceivable that persons from whom the information or remnant tissue is obtained could have personal objections to the use of their tissue for research, notwithstanding the de-identification of such tissue and would not have participated in the research study if he had been informed of the possible subsequent use of the information or tissue samples.

4. We do, however, recognise that there may be situations where it would be appropriate for such consent to be waived. This should be the exception rather than the rule and should involve consideration and approval by the bodies involved in approving the research.

5. We agree generally with the statement that "(t)he information to be provided to the individual when taking consent should depend on the sensitivity of the information and the risk of harm", It is not clear what "harm" is envisaged and how this should be balanced against the sensitivity of the information.

RECOMMENDATION 3

We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to disease registries by health care institutions and physicians; and establish mechanisms enabling the registries and healthcare institutions to increase the accessibility of personal information for research that can significantly advance public welfare, while safeguarding privacy concerns.

RECOMMENDATION 4

We recommend that the relevant authorities consider establishing legal mechanisms to facilitate the use of personal information in registries, databases and medical records for epidemiological research and public health research. These mechanisms should also ensure that there is minimal risk to individual privacy and confidentiality.

6. The members of this Committee had previously commented that there are no decisions by the Singapore courts on the ambit and the applicability of public policy as a defence to the disclosure of confidential information and would agree that the legal position should be clarified by the relevant authorities.

RECOMMENDATION 6

We recommend that IRBs, when reviewing research, ensure that any concerns in regard to vulnerable persons are appropriately addressed.

7. We are of the view that guidelines or safeguards should be recommended and put in place to address the vulnerability of patients who are recruited by their treating physicians/ medical practitioners for research personally undertaken by their treating physicians/ medical practitioners.

RECOMMENDATION 7

Research participants should be allowed to withdraw their consent to participate in a research at any time without explanation and without prejudice. They should be assured that upon withdrawal their personal information and/or tissue samples will either be destroyed or irreversibly de-identified.

8. A distinction may need to be drawn between research participants who continue to be involved in research, for example, through the use of trial medication, and participants whose only involvement is to provide a tissue sample.

9. Clearly, if a research participant has a continuing involvement in the research, he is entitled to withdraw at any time and he should be informed of that right.

10. It is arguable that if the research participant only provided a tissue sample and has done so, the participant has surrendered "ownership" or rights to the sample. In that event, the participant may not be entitled to insist that the tissue sample should be destroyed and the researchers may not be obliged to destroy the sample, as long as the sample is used only for the purpose of the research for which it was provided.

11. However, there is a consensus that a research participant continues to have a right to confidentiality and should be assured that their personal information is destroyed or irreversibly de-identified and procedures must be put in place to ensure that this is actually carried out upon the withdrawal of the research participant.

12. The members of this Committee had previously addressed this point in the comments on the BAC's earlier Consultation Paper On Ethical, Legal And Social Issues In Genetic Testing And Genetics Research. For ease of reference, our previous comments are set out again below:-

2.1 Although the right of the individual to withdraw his consent in participating in the research study is recognised, it is not clear what the individual's rights are following the withdrawal of his participation in Genetic Testing in respect of:-

(a) the genetic material already taken from him; and

(b) the information/ results derived from such material.

2.2 We would suggest that there be a mechanism for the individual to withdraw from the test and at the time his consent is taken, information setting out how the individual can withdraw.

2.3 *Further, information should also be provided at the outset to the individual, stating whether the individual can insist on the destruction of all material and test or research results upon his withdrawal from the research, and if not, assurances as to anonymization of the information derived from the genetic material and whether the information can be traced to the individual.*

RECOMMENDATION 13

We recommend that the government consider implementing a moratorium on the use of predictive genetic information for insurance purposes and appoint an authority to consider long-term implications of the accessibility of predictive genetic test results by employers and the insurance industry and to monitor developments in this area.

13. It is unclear if the recommendation is intended to prevent disclosure or use of the information. We are of the view that the moratorium on the use of predictive genetic information should relate to its disclosure to employers and insurers for the purposes of this paper and the recommendation should include the consensus that no one should be compelled to undergo genetic testing as part of a pre-employment medical examination or in order to obtain insurance coverage.

Date: 26 July 2006

Life Insurance Association, Singapore

From:	Pauline Lim Executive Secretary Life Insurance Association, Singapore
Received by email:	28 July 2006

Comments received from three LIA member companies

We suggest that BAC make reference to other established research, such as the Australian policy on genetic testing.

Comments on the following two clauses:

6.14 Following the recommendations of the Select Committee, a moratorium was implemented by agreement between the UK Government and the Association of British Insurers from 2001. Under the moratorium, a person will not be required to disclose the result of a predictive genetic test unless approved by the GAIC (to date, only Huntington's Disease has been approved) and is for coverage of more than £500,000 of life insurance or £300,000 for critical illness insurance or income protection insurance with annual benefits of £30,000. The initial duration of the moratorium was 5 years and was later extended for another 5 years, to 2011.

6.15 We are of the view that a similar moratorium on the use of predictive genetic information could be considered in Singapore. This will allow both the insurance industry and relevant government authorities time to look into the substantive issues. Both parties should ensure that only relevant and reliable information is used in assessing insurance applications, and that the outcomes of the conditions considered are both serious and predictable, before considering lifting any such moratorium.

My view about the above practice and recommendation (6.14 and 6.15):
Predictive genetic testing has considerable potential for accurate risk assessment, although in the same time we should not deny that most predictive tests carry a degree of uncertainty about whether a condition will develop, when it will develop, and how severe it will be. (Note: Predictive genetic testing is the use of a genetic test in an asymptomatic person to predict future risk of disease.) So, to an Insurer, predictive genetic test result should be seen a material fact that could be deemed as a "NON DISCLOSURE" if an insurance's applicant fails to reveal such info upon application.

To give an idea about how big the risk could be, I illustrate with the following scenario for an example.

If two people who carry the defective gene of cystic fibrosis conceive a child, there's a 25 percent chance the child will have cystic fibrosis, a 50 percent chance the child will be a carrier of the cystic fibrosis gene, and a 25 percent chance the child will neither have the disease nor be a carrier.

(Note: cystic fibrosis is an inherited abnormality due to recessive defective genes. Manifestation of this condition could result in damage of lung, intestine, and other internal organs. The "recessive" nature of this condition means that this abnormality will only manifest/appear when a person inherits two abnormal cystic fibrosis genes, one from her father and another one from her mother. The condition becomes obvious when the child was 2-3 years old. If a person only has one defective gene and the other gene is normal, the abnormal condition does not manifest).

Positive predictive value of genetic test for this condition is 99.5% (meaning 99.5% of persons with positive genetic test result for cystic fibrosis are truly having cystic fibrosis gene). On the other hand, Negative predictive value of genetic test for this condition is 99.96% (meaning 99.96% of persons with negative genetic test result for cystic fibrosis are truly not having cystic fibrosis gene). These two values suggest considerably accurate predictive genetic test for cystic fibrosis.

So, if a positive result of predictive genetic test of a child from the above mentioned couple were not disclosed upon applying Insurance, then the insurer would be facing about 33% (see formula below) risk to cover the child with cystic fibrosis. Quite substantial risk, isn't it?

We would like to refer to comments made regarding NOT recommending a moratorium period as suggested in the consultation paper. The main reasons being:

1. it may be irrelevant as very few individuals go for a test
2. it can be mis-interpreted as the industry's willingness to waive its right for genetic discrimination

To emphasise point 1, I would like to share the comment made by Mary Francis, director general of the ABI, said in a statement:

"... because the existing moratorium works well, and the number of people currently taking relevant tests remains low, we felt confident about proposing to the government that it should be extended."

مجلس اكام اسلام سيغافورا
Majlis Ugama Islam Singapura
(Islamic Religious Council of Singapore)

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7 August 2006

DID: 63591473
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Associate Professor Terry Kaan
Chairman, Human Genetics Subcomittee
Bioethics Advisory Committee
11 Biopolis Way
#10-12 Helios
Singapore 138667

Dear Sir,

RE: REQUEST FOR FEEDBACK ON CONSULTATION PAPER

We refer to your letter requesting our organisation's view on the Bioethics Advisory Committee's consultation paper entitled "The Use of Personal Information in Biomedical Research".

2 We append herewith our comments on the recommendations made in the paper.

3 We would also like to apologise for the delay in the response.

Thank you.

Yours sincerely

Nazirudin Mohd Nasir
Head,
Office of the Mufti
Islamic Religious Council of Singapore

Feedback from Majlis Ugama Islam Singapura (MUIS) on
BAC's Consultation Paper entitled
The Use of Personal Information in Biomedical Research

Introduction

The Majlis Ugama Islam Singapura (MUIS) has been invited to comment on the issues and recommendations contained within the Bioethics Advisory Committee's (BAC) consultation paper entitled "The Use of Personal Information in Biomedical Research". The comments are offered in the following three sections:

(i) Protection of Individual Rights

(ii) Pursuit of Public Interests

(iii) Balance between Individual Rights and Public Interests

(i) Protection of Individual Rights

2 All members of the human race are endowed with dignity, nobility and honour. Islam views dignity as one of the natural rights of every individual. The securing of one's dignity and honour is considered a principle of governance and an ethical code for interaction among people. It is not permissible to violate the personal dignity of anyone, regardless of religion, status or reputation.

3 The principle of securing the right of an individual to his/her dignity and honour entails the securing of the individual's right to his/her privacy. The right of an individual to his/her own privacy is considered as a divine right, given by Allah Al-Mighty as mentioned in the authentic sources of the religion. The Holy Qur'an has laid down the injunction: "Do not spy on one another" (49:12). The Islamic legal system adopts this principle in prohibiting unlawful entries and

searches, to the extent that incriminating evidence obtained by eavesdropping or other unlawful means cannot be used for prosecution. [1]

(ii) Pursuit of Public Interests

4 Concurrently, every member of the community has the duty to share public responsibility and promote public interest (*maslahah*). Islam places as much importance on public interest as it does on individual rights. In Islam, it is not only obligatory to do no harm toward others, but also to proffer benefit to the larger public welfare. Activities that lead to the securing of public interests are encouraged.

5 The Islamic legal philosopher, Abu Ishaq As-Syatibi (d. 790), identifies the enhancement of human life as one of the types of public interest that ought to be secured. This includes scientific research which leads to the prevention and treatment of diseases.

6 In any research work that benefits mankind, the protection of human dignity and all that such a principle entails, must be upheld. As such, strict guidelines must be institutionalised to protect confidentiality and human dignity for any research work.

(iii) Balance between Individual Rights and Public Interests

7 Exceptions from the requirement of safeguarding confidentiality are made in cases where doing so may cause greater harm, insofar as the safety of the society at large is at jeopardy, such as the case with an epidemic. This seemingly competing interest, between one's right to privacy and confidentiality, and the larger public welfare, calls for a delicate balancing act, where individual rights are protected, whilst beneficial scientific progress continues to be pursued.

---

[1] Weeramantry, C.G. *Islamic Jurisprudence: An International Perspective*. Islamic Book Trust, The Other Press (Malaysia). 1996.

8 The recommendations by the BAC contained within the consultation paper, have largely taken into consideration the above principles, and have shown due care in balancing between the advancement of scientific research, on the one hand, and the protection of privacy and confidentiality, on the other. We find the recommendations agreeable and offer the following additional points:

i. We are fully supportive of the need to establish a legal framework for the use of personal information in biomedical research (Recommendation 1).

ii. All personal information should be irreversibly de-identified (Recommendation 8), unless doing the contrary is deemed necessary.

iii. In line with (Recommendation 7), the wishes of research participants should be respected at all times. As such, disclosure of information is possible if a participant has expressed, at the outset, explicit consent knowledgeably and willingly, that his/her information may be identified for future use, and that such information will be utilised to benefit the research work.

iv. In a situation where it is deemed necessary to identify personal information, whether before the initiation of, or at some point during, a research work, the case should be presented before the Institutional Review Board (IRB) for their assessment.

v. We recommend that the types of research which may require identification of the subjects or individuals be drawn up by the IRB to be used as guidelines by the research bodies.

vi. Appropriate and sufficient legal measures should be in place to address any attempts to identify an individual from de-identified information.

END

National Cancer Centre

Comments on the BAC consultation paper entitled 'The use of personal information in biomedical research' dated 14 June 2006

The intent and recommendations of this document echo trends and developments in other countries (mainly Western) in recent years. To this extent, the paper is timely and its recommendations are generally sound. A notable feature is the attempt to achieve a good balance between injurious disclosure of personal information (a well recognised hazard) and rigid and counterproductive overprotection of medical information that hinders and even prevents medical research, to the detriment of whole societies.

While the principles enunciated in the consultation paper are unexceptional and in line with current bioethical thinking, a few operational points could be made.

1. It is reasonable that data for certain disease registries (of public health importance) may be obtained without patients' explicit and prior consent (page 3, Part IV, para. 11; page 23, para. 4.25). It is also proper that the Singapore population be 'appropriately informed' of this practice. However, the BAC does not indicate what it considers to be appropriate measures of informing the public, whether members of the public will have the right to opt out of disease registries (page 31, section 5.4 suggests this may be allowed), and whether certain future types of disease registries (e.g. neuropsychiatric disorders) will be handled differently. It is also unclear if trawling for data for disease registries will be limited to patients who attend public hospitals and clinics or if private hospital data will be used also for disease registries (page 24, para. 4.28). If the former, the perception (not entirely unjustified) that money buys privacy will arise.

2. In discussing irreversibly de-identified information (page 18, para. 4.12), the consultation paper states that 'the individual should be able to opt out'. This does not appear possible if the information and/or biological sample of an individual has in fact been truly and permanently de-identified.

3. There can be no good substitute for children and adolescents as research subjects for certain objectives such as determining paediatric drug safety and optimal dosing. Thus it is inaccurate to state that children and adolescents should be research participants only when other participants (presumably adults) are unavailable or unsuitable (page 29 , para. 4.45).

4. The age of legal consent for medical decisions is currently ambiguous in Singapore. It would be helpful for the BAC or the relevant authorities to provide clearer guidelines on this fundamental point. Situations when parents and their adolescent children disagree will need to be dealt with.

5. While it is standard practice to enable research subjects to withdraw their participation (page 30, para. 4.52) and for such withdrawal to be accompanied by destruction of any residual biological samples, and complete and permanent erasure of personal information from the research database, it is unclear if research data already obtained from the patient's sample(s)/medical record before the decision to withdraw, may be retained by the investigators.

6. The consultation paper refers to close genetic relatives but omits to deal with how preserving the traditional confidentiality of the physician-patient relationship should be balanced against the need to provide relevant genetic information to the patient's close relatives, in the event that the index patient is unwilling to make the disclosure to his/her family (page 31, para. 5.3).

7. Much of the substance of the consultation paper is more reflective of Western societies than Singapore. While the principles of ethics are universal, the practice of bioethics must be culturally emplaced or it becomes a fig leaf. Much is made of obtaining 'informed consent', but little regards is paid to evaluating how much information patients and research subjects in Singapore wish to receive, the language that best conveys information and the extent of comprehension. There is a need for Singapore to conduct studies to develop and assess culturally appropriate consent practices in order to determine if the informed consent process, as practised in Singapore, is indeed achieving its true intended purpose.

Kon Oi Lian
22 June 2006

National Council of Churches of Singapore
新加坡基督教會協會
சிங்கப்பூர் திருச்சபைகளின் தேசிய மன்றம்

13 July 2006

Associate Professor Terry Kaan
Chairman
Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way, #10-12 Helios
Singapore 138667

Dear Prof Kaan

THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

Thank you for seeking feedback from the National Council of Churches of Singapore on the above subject.

We hereby enclose our response to ***"The Use of Personal Information in Biomedical Research".***

We trust that this feedback will receive careful and serious consideration.

Thank you

Yours sincerely

BISHOP DR ROBERT SOLOMON
President
National Council of Churches of Singapore

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Co. Reg No. ROS 146/51/REL

Comments on the Bioethics Advisory Committee's Consultation Paper on *The use of personal information in biomedical research*

Presented by the National Council of Churches of Singapore

The National Council of Churches of Singapore (NCCS) thanks the BAC for seeking feedback on the consultation paper, 'The use of personal information in biomedical research'. The NCCS notes that the intent and recommendations of the consultation paper echo trends and developments in other countries (mainly Western) in recent years. To this extent, the paper is timely and its recommendations are generally sound. A notable feature is the attempt to achieve a good balance between injurious disclosure of personal information (a well recognised hazard) and rigid and counterproductive overprotection of medical information that hinders and even prevents medical research, to the detriment of whole societies.

While the principles enunciated in the consultation paper are unexceptional and in line with current bioethical thinking, a few operational points could be made.

1. NCCS suggests that Recommendation 1 (page 2) be strengthened by adding two words (underlined) as follows:
   'We recommend that the relevant authorities consider establishing a legal framework for the use and protection of personal information in biomedical research.'
   The rationale is to guard against sliding into a purely utilitarian approach to the use of personal information driven only by expedience and economic motives. Emphasizing the twin responsibilities of researchers both to use and protect should help to defend vulnerable persons against disrespect, abuse and even exploitation.

2. It is reasonable that data for certain disease registries (of public health importance) may be obtained without patients' explicit and prior consent (page 3, Part IV, paragraph 11; page 23, paragraph 4.25). It is also proper that the Singapore population be 'appropriately informed' of this practice. However, the BAC does not indicate what it considers to be appropriate measures of informing the public, whether members of the public will have the right to opt out of disease registries (page 31, section 5.4 suggests this may be allowed), and whether certain future types of disease registries (e.g. neuropsychiatric disorders) will be handled differently. It is also unclear if trawling for data for disease registries will be limited to patients who attend public hospitals and clinics or if private hospital data will be used also for disease registries (page 24, paragraph 4.28). If the former, the perception (not entirely unjustified) that money buys privacy will arise.

3. In discussing irreversibly de-identified information (page 18, paragraph 4.12), the consultation paper states that 'the individual should be able to opt out'. This does not appear possible if the information and/or biological sample of an individual has in fact been truly and permanently de-identified.

4. While we agree with the principle of reciprocity (page 20, paragraph 4.20), it must not be used, for economic reasons, to pressurise or coerce anyone to forego their right to privacy and confidentiality.

5. There can be no good substitute for children and adolescents as research subjects for certain objectives such as determining paediatric drug safety and optimal dosing. Thus it is inaccurate to state that children and adolescents should be research participants only when other participants (presumably adults) are unavailable or unsuitable (page 29, paragraph 4.45).

6. The age of legal consent for medical decisions is currently ambiguous in Singapore. It would be helpful for the BAC or the relevant authorities to provide clearer guidelines on this fundamental point. Situations when parents and their adolescent children disagree will need to be dealt with.

7. While it is standard practice to enable research subjects to withdraw their participation (page 30, paragraph 4.52) and for such withdrawal to be accompanied by destruction of any residual biological samples, and complete and permanent erasure of personal information from the research database, it is unclear if research data already obtained from the patient's sample(s)/medical record before the decision to withdraw, may be retained by the investigators.

8. The consultation paper refers to close genetic relatives but omits to deal with how preserving the traditional confidentiality of the physician-patient relationship should be balanced against the need to provide relevant genetic information to the patient's close relatives, in the event that the index patient is unwilling to make the disclosure to his/her family (page 31, paragraph 5.3).

9. Much of the substance of the consultation paper is more reflective of Western societies than Singapore. While the principles of ethics are universal, the practice of bioethics must be culturally emplaced or it becomes a fig leaf. Much is made of obtaining 'informed consent', but little regards is paid to evaluating how much information patients and research subjects in Singapore wish to receive, the language that best conveys information and the extent of comprehension. There is a need for Singapore to conduct studies to develop and assess culturally appropriate consent practices in order to determine if the informed consent process, as practised in Singapore, is indeed achieving its true intended purpose.

COMMENTS FROM NATIONAL MEDICAL ETHICS COMMITTEE (NMEC) ON THE BAC CONSULTATION PAPER (THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH)

The BAC consultation paper on "The Use of Personal Information in Biomedical Research" is a good report. NMEC's comments on the BAC consultation paper would focus generally on the personal information that is recorded as part of clinical management within biomedical research.

	Section	**NMEC Comments**
Part II	Personal Information (p.2 and p.11)	Genetic information is particularly sensitive and therefore genetic studies require special precautions. For example, IRBs use a separate template for Informed Consent in genetic studies, which include statements such as "genetic information can affect a person's insurability, employability, reputation and private life." NMEC proposes a cross reference to BAC's Genetic Testing and Genetic Research Report wherever genetic studies are involved.
	Item 2.7(b) (p.13)	For genetic studies, IRBs usually require double coding, i.e. de-identification for the subject and another de-identification for the genetic sample.
	Item 2.6 (p.13)	NMEC recommends inserting a statement in this section regarding the recruitment of trial subjects. There could be opportunities when investigators might approach departments which keep medical records, such as the Medical Records Office, X-Ray Department, Pharmacy, and Laboratory, for names of patients who are potential trial subjects. If the investigator then contacts the patient (without asking the attending physician), it will be a breach of medical confidentiality. All the patient has to do is ask "How do you know I have Parkinson's Disease? (Or whatever the diagnosis)" as medical diagnosis is private information. Such breach of medical confidentiality happens easily in institutional practice, such as large national centres or re-structured hospitals where there is a general feeling that the patients' data belong to the centre or department concerned. The role of the attending physician is therefore important during the recruitment of trial subjects. There could potentially be an ethical problem of touting for patients under the disguise of "medical research" through such means.

	Section	NMEC Comments
Part III	The Legal Protection of Personal Information	With the increasing use of digitalization in healthcare data and information, there should be more transparency in the processes which ensure that digitalized information is adequately protected from unauthorized access or manipulation by the IT personnel. Moreover, in both healthcare clusters, the staff can access the medical information of any patients through their passwords. Therefore, it will be essential that healthcare institutions (both public and private) and disease registries should have policies and systems for tracking access to patients' electronic information. For example, in strengthening the security of the access to any kind of medical database, including disease registries, passwords given to authorized staff for such access should be "blinded" to the IT personnel. Healthcare institutions should have proper systems for safeguarding patients' personal and medical information from the auditors, including the information system managers.
	Data or samples that are sent abroad	There is no extraterritorial law with regards to data or tissue samples transferred abroad. Singapore laws can be applied only locally. There is no common law to govern the ownership of any tissue from a dead person. It is therefore recommended to clarify these issues clearly in the informed consent form, possibly in the nature of a contract, with a time frame, to ensure no dispute in the transfer of these tissue samples. IRB approval should be required for any movement of sensitive data or tissues' specimen across the country borders, for research purposes.
Part IV	Informed Consent	A living person can withdraw his or her consent, but this is not the case for a person who has passed away. However, the issue of confidentiality still applies even after the demise of the person. Although the IRB is the gatekeeper for this confidentiality, the question of liability and position of IRB would be raised if the next-of-kin should pursue legal action for breaches of confidentiality for the deceased. Even in common law, no one has ownership of the body parts for a deceased person, which cannot be claimed legally. To avoid breaching medical ethics and the legislation, NMEC proposes that researchers seek for informed consent to use tissue specimens for research purposes, consent to

	Section	NMEC Comments
		remove the tissue from the body, as well as the way it can be disposed of.
	Items 19 & 4.44 (p.5 and p.28)	(a) children and adolescents NMEC opines whether it is possible to make a statement regarding the Age of Consent. Very often, multi-centre trials (with foreign countries) involve subjects from the age of 18 years. So IRBs in Singapore are frequently faced with the dilemma of whether to amend the age to 21 years, which might not be right as this could alter the character of the trial cohort or stipulate that parental permission is required for subjects below 21. The "level of maturity" is mentioned in Item 4.47, line 6. NMEC proposes to substitute "Age of Maturity" which could be a better guide than the legal Age of Consent.
	Items 4.47, 4.48 (p.29)	Vulnerable subjects, such as adolescents or mentally impaired persons, may not want to disclose information to a third party or their guardian, in which case, it would be difficult to carry out the research study. If the study is essential, i.e. in their medical interests, we should be allowed to disclose relevant information to an appropriate person or authority (General Medical Council, UK ruling on Confidentiality, 2004)
	Items 19 and 4.44 (p.5 and p.28)	List of "Vulnerable persons" NMEC recommends that the list of "vulnerable persons" include "Pregnant Women and Foetuses", as they are "at heightened risk for adverse consequences of the research".
	Recommendation 3, 4 and 5	Recommendations 3, 4 and 5 would have significant impact on clinical practices. It is necessary to have a formal framework for accessibility of personal information by disease registries. In general, disclosure of information about a patient requires the patient's consent but there can be exceptions, such as information transferred to disease registries. In the USA, patients might not agree to such exceptions. There could also be a recommendation in the BAC report for the requirement in reporting side effects of Traditional Chinese Medicines (TCM), in the same way as there is for western medicines. NMEC opines whether the TCM Act could contain a statement allowing the traditional medical practitioners to disclose

	Section	NMEC Comments
		medical information in the public interest, e.g. adverse reactions from TCM practitioners.
Part V	Privacy and Confidentiality	The principle of primacy of ownership of health data should be recognized, unless there is the urgency of serious public health concerns (e.g. infectious diseases). Doctors treating patients have the rights to the data, but only for treating the patient. Similarly, HCIs own the medical records, but only to facilitate the treatment needs of the patient. The patient's data should not be used for any other purposes. Security of databases can be penetrated in some way by researchers, so there is a need for an internal security process to ensure appropriate anonymisation of data at the hospital and registry levels. (With digitalization of data, a person's health data can be disseminated very widely and rapidly. What if information in the records is false, for example, a person might be wrongly recorded as having tested positive for syphilis?)
	Recommendation 13	NMEC recommends a moratorium on the use of predictive genetic information for insurance purposes.

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18 July 2006

Assoc Prof Terry Kaan
Chairman
Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way, #10-12 Helios
Singapore 138667

Dear A/Prof Kaan

FEEDBACK ON CONSULTATION PAPER ON THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

Thank you for the Consultation Paper.

Under para 2.2 of this paper, an "image" is considered information that identifies an individual. However often times pictures of patients are used in publication to illustrate the condition and discussions.

I feel it should be explicitly stated that images of patients may be used in publications for research and training if the patient cannot be identified from these images.

Yours sincerely.

Assoc Prof Roy Chan
Director

DID: 63508473

\Bioethics Advisory Committee – Consultation paper feedback\jw

Robert Hewitt, 31st July 2006
NUH-NUS Tissue Repository

Comments On Consultation Paper Entitled: The Use Of Personal Information In Biomedical Research

Many of the ethical issues that surround management of collections of personal data are identical to those relating to collections of tissue samples, since tissue samples contain personal genetic information. Patients require protection against misuse of personal information, whether their personal data or their tissue samples are being stored and used for research. This protection should include physical security, de-identification, access control by an ethics committee and legal protections.

Experience from tissue banking shows us that "informed consent" is interpreted in many different ways by different people. If conducted to a high standard, it is time-consuming, expensive and may be inconvenient to the patient. Typically, informed consent takes 15 to 20 minutes, and can only be taken when the patient is available and not being seen by medical or nursing staff. Consequently the difficulty in obtaining full "informed consent" is very easily underestimated. The question always remains as to whether patients who have been fully informed also fully understand the implications of consent, since the issues involved are complex. Consent forms are often hard to understand and at best, many of these forms are only understandable by people with a college education. If "informed consent" is to be required, then the practical implications and limitations should first be fully understood and the costs weighed up against the benefits.

For tissues, we have the concept of a legacy and non-legacy tissue collections, which is helpful in allowing ethics committees to take into account the difficulties in obtaining consent from patients who have left the hospital, moved away or perhaps even died. Ethics committees can relax the requirement for informed consent for legacy tissue collections, since obtaining it is often difficult/impossible. If informed consent is to be required for use of personal information, then perhaps the concept of legacy and non-legacy databases should be considered. Or perhaps a similar distinction could be made between retrospective and prospective data collection (where consent requirement is strongest for prospective collection of data).

The BACs recommendations for human tissue research state that research tissue banking should only be conducted by institutions and not by private individuals. This helps ensure that tissue samples are available to the most deserving researchers and not reserved by people whose circumstances allow them to collect the sample. Should the same apply to registries? Either way, the subject of researcher access to clinical information needs to be given careful attention. Should clinicians be allowed to control access to de-identified data from the patients they have treated, should "strings attached" be permitted, or should the information be freely available to approved researchers?

Comments on specific recommendations:

Recommendation 1: We recommend that the relevant authorities consider establishing a legal framework for the use of personal information in biomedical research.

Agreed, we need a legal measures to protect individuals against misuse of their personal information, because other protective measures are inadequate by themselves: *De-identification* alone does not provide sufficient protection, whether described as reversible or irreversible: Given that information on a given patient may be stored on many different databases, it may be possible to re-identify a patient by simply matching a combination of items in a patient's medical history. Similar difficulties apply for tissue samples which may be associated with the clinical data: The forensic scientist's ability to identify suspects from DNA samples, points to the fact that absolute irreversible de-identification of tissue samples is not possible, short of complete destruction of the contained genetic information. *Informed consent* is an important measure to show respect for patient autonomy, but it only offers protection against research-associated risks (eg. social or financial consequences) if the patient declines consent. If the patient agrees to participate, then their consent offers no protection at all against research risks. *Ethics committee approval* may help ensure that data is only used by appropriate researchers, but it cannot guarantee their good conduct.

Recommendation 2: Specific consent should be obtained when research involves identifiable personal information or tissue samples. General consent may be obtained for subsequent research involving the use of de-identified information or remnant tissue. ……

This recommendation may be difficult to apply in the context of Hospital-based Cancer Registries (HCR), since this kind of registry which contains very detailed clinical information, is used to help in the clinical management of patients. The information is regularly updated by a Cancer Registrar at each follow-up visit and may be used to ensure that patients attend all their follow-up appointments. For this reason, the information needs to remain identified. To require specific informed consent for data entry to an HCR would cause many problems. Firstly, if patient refused consent it would prejudice the quality of their own clinical care and this would be unacceptable. Secondly, it would diminish the value of the registry for clinical audit and other forms of research.

Perhaps the term "disease registry" needs to be defined. Is it simply a database of clinical information or does it carry some other more specific meaning? Also, would an HCR fit into the definition of registry as used in these recommendations?

One small note: If specific informed consent is obtained for identifiable material, it may be advisable to request general informed consent at the same time. This would allow subsequent de-identification and unspecified use of the information without the need for re-consent.

Recommendation 4: We recommend that the relevant authorities consider establishing legal mechanisms to facilitate the use of personal information in registries, databases and medical records for epidemiological research and public health research. These mechanisms should also ensure that there is minimal risk to individual privacy and confidentiality.

The importance of facilitating use of personal information for epidemiological and public health research is singled out in this recommendation. However there are other types of research requiring clinical information, which are also very important in terms of improving patient care. For example, clinical trials and biomarker studies. Is there some reason why it is considered less important to facilitate use of personal information for such studies? Agreed, the benefits are less immediate, but obviously they are important all the same.

Recommendation 7: Research participants should be allowed to withdraw their consent to participate in a research (study) at any time without explanation and without prejudice. They should be assured that upon withdrawal their personal information and/or tissue samples will be either destroyed or irreversibly de-identified.

Recommendation 10: Irreversibly de-identified personal information generally need not be subject to privacy and confidentiality requirements.

As argued above, absolute irreversible de-identification is not possible. Following along on this line of argument, withdrawal should mean both removal and destruction (*in contrast to recommendation 7*) and privacy and confidentiality requirements should still be required for information described as irreversibly de-identified (*in contrast to recommendation 10*).

Recommendation 9: Researchers should not attempt to identify an individual from de-identified information as it is a serious breach of ethics to do so.

Agreed, researchers should not attempt to re-identify cases themselves. However, researchers often need to obtain additional information for cases on which they have studied previously (this often applies for tissue samples) and to provide such information, re-identification is necessary.

For this reason there needs to be an approved third party (eg. a tissue repository), which can re-identify cases, link additional information, de-identify and then return required information to the researcher. This is labour intensive work and requires dedicated individuals to carry it out reliably. The process of re-identification should not be made too slow or difficult, otherwise it will create a bottleneck for research.

All other recommendations (3, 5, 6, 8, 11, 12 and 13): Agreed and no further comment.

Faculty of Science
Department of Biological Sciences

NUS National University of Singapore

Associate Professor Terry Kaan
Chairman
Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way, #10-12 Helios
Singapore 138677

July 31st 2006

Dear Terry,

Thank you for asking the Office of Life Sciences, NUS for feedback on consultation paper on the use of personal information in biomedical research.

1. The paper is well written, timely and it covers many of the important aspects of patient's right and confidentiality and the needs for biomedical research. It is a balanced document.
2. We understand that Professor Lee Hing Ping, Chair, IRB of NUS has also provided his feedback directly to the committee.

With best regards

Hew Choy Leong
Professor and Director
Office of Life Sciences
NUS.

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East Shore Hospital, Gleneagles Hospital, Mount Elizabeth Hospital

29 June 2006

Associate Professor Terry Kaan
Chairman Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way
#11-12 Helios
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BY FAX AND MAIL
FAX NO: 64789956

Dear Professor Kaan

CONSULTATION PAPER ON THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

Guidelines on the use of personal information in biomedical research are timely and will be much appreciated by all involved in such research.

The BAC has obviously given these issues much thought and the consultation paper is indeed well balanced and comprehensive.

One area of concern is the definition of the age of consent. The legal age of consent in Singapore is twenty-one. There is confusion as to whether there are exceptions to this. Should someone less then the age of 21 but over the age of 18 and is financially independent; or is married; or is a member of the Singapore Armed Forces be treated as an exception and deemed able to give informed consent independent of the legal guardian?

It may be useful for Section IV of the guidelines which deals with informed consent to address and clarify this issue.

With kind regards

Yours sincerely

Dr S Thanasekaran
Head Medical Affairs
Parkway Hospitals (S) Pte Ltd

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Feedback on Consultation Paper of
The Use Of Personal Information in Biomedical Research
From The Singapore Chinese Buddhist Association

From Buddhist point of view, we do not object the research carried out for medical purposes of benefiting mankind as long as no killing is involved. As we can see this is the case of your Biomedical Research. However, there are other concerns that we have relating to the privacy and protection of individual rights-how can we protect them and the way to do it? We would like to raise the following concerns:

1. **The Legal Protection of Personal Information**

   a). When a person's information is required and is vital to be used for research but is not contactable, will the research still be carried out without the notification and the consent of the person involved.

   b). As the research may involve researchers from other countries, what measures will there be to ensure that information is not being transferred out secretly or without the consent of the person? How do we ensure that the information is firmly protected and not used by the researcher in future once he leaves our local center?

2. **Informed Consent**

   How we can ensure that the explanation is correctly and precisely explained to the person who may be an illiterates or not conversant in English? Where translation is involved we need to make sure the translator can relate to the person?

3. **Epidemiological and Public Health Research**

   If large numbers of public do not give their consents to the Board for the research, will the research still be carried out without obtaining the agreement form them?

4. **Privacy and Confidentiality**

   The concern is that the information may be used by foreign researcher who may use the same information in other countries or takes it with him when he leaves our laboratory?

5. **Access to Medical Information by Employers and Insurers**

   We should stress to the employers and insurance company that the normal health screening should not involve genetic test which is strictly for research

purposes only and should not be part of health screening of the employees or the insured.

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Reg No.: ROS 198/59 TAP

2 August 2006

Associate Professor Terry Kaan
Chairman
Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way, #10-12 Helios
Singapore 138667

Dear Associate Professor Kaan

REQUEST FOR FEEDBACK ON CONSULTATION PAPER "THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH"

1. Thank you for your letter dated 14 June 2006 in which you requested feedback from the Singapore Medical Association regarding the consultation paper, "The Use of Personal Information in Biomedical Research", put up by the Bioethics Advisory Committee.

2. The paper is well-written, and we agree with most of the recommendations in the paper, which should serve to accelerate the adoption of best practices in the management of personal information in biomedical research, although we note it also attempts to provide coverage for clinical audit.

3. We would, however, like to highlight the challenges posed by Page 17, Para 4.8 on consent taking by the researcher who is also the attending physician, which was mentioned in previous BAC report on human tissue research and guidelines for IRB:

   "...particular caution is necessary when the attending physician is also the researcher...patients may feel under obligation to their physicians...we recommend that the consent for research participation in such a situation be obtained by a competent third party."

   We recognise that this recommendation echoes the attempt by the Declaration of Helsinki to address the issue of coercion by dependent relationships and therapeutic misconception, where it is stated in clause 23 that:

   "When obtaining informed consent for the research project the physician should be particularly cautious if the subject is in a dependent relationship with the physician or may consent under duress. In that case the informed consent should be obtained by a well-informed physician who is not engaged in the investigation and who is completely independent of this relationship."

4. These are admirable research ethics standards. However, when taking into account local factors such as culture and belief system of patients, and limited resources available, the application of these ethical ideals are expected to pose certain practical challenges at the ground.

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5. Locally, most of our patients agree to take part in clinical research projects due to their trust and confidence in their physicians. Having a 'stranger' take the consent will most likely result in many patients declining participation. Ironically, this very relationship that the doctor has with the patient that can potentially generate conflict of interests and coercion, is also the very force that will enhance trust and communication between researcher and subject.

6. Enforcing the ethical standard as a legal requirement would mean that the budgeting of a clinical study will have to take into account the resources available to engage or involve a "well-informed physician" who is not involved in the investigation and who is completely independent of this relationship. Not only must such a well-informed physician (i.e. one who is able to answer all the requirements outlined by these very guidelines and declarations) be available in the institution, he or she must practically and physically be available to take the consent on behalf of the PI. In these days when every minute of the time consumed by a "well-informed physician" to obtain this consent has to be accounted for, the cost of research will rise significantly, and this may retard the development of clinical research.

7. If this other "well-informed physician" is not available, and the only available physician is not "well informed", i.e. unable to do a competent job in the consent process, failing to provide adequate information or clarification, makes unreasonable and unrealistic claims, it would lead to another ethical problem of poorly obtained informed consent of questionable quality, which can be a far more serious problem. Furthermore, informed consent is a continuous process, with an ongoing communication between researcher and subjects as the study proceeds. It is questionable if this other "well-informed physician-consent taker" will always be available.

8. One other point we would like to raise is the lack of clarity as to whether the recommendation on clinical audit include quality improvement initiatives. Many of such projects hover around the areas between clinical research and health services research, can sometimes pose significant risks to the privacy and confidentiality of participants. Perhaps the BAC could consider recommending the establishment of IRB-like review bodies to handle the ethical aspects for such projects.

9. Lastly, as mentioned in your letter, we are agreeable to having these comments published in your final recommendations to the Steering Committee on Life Sciences.

I hope the above will be of help to you and your committee.

Thank you.

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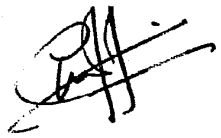
Reg No.: ROS 198/59 TAP

Yours sincerely



Dr Chin Jing Jih
Executive Director,
Centre for Medical Ethics and Professionalism
On behalf of 47th Council, Singapore Medical Association

SINGAPORE MEDICAL COUNCIL'S FEEDBACK ON BAC'S CONSULTATION PAPER ON "THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH"

Recommendation 2: Specific consent should be obtained when research involves identifiable personal information or tissue samples. General consent may be obtained for subsequent research involving the use of de-identified information or remnant tissue. The information to be provided to the individual when taking consent should depend on the sensitivity of the information and the risk of harm.

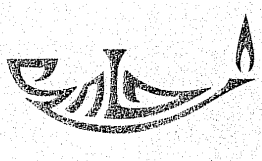
Comments: It will sometimes be difficult to determine what the risk of harm might be in research of this nature – so the last sentence of this recommendation is hard in enforce and rather vague.

Recommendation 7: Research participants should be allowed to withdraw their consent to participate in a research at any time without explanation and without prejudice. They should be assured that upon withdrawal their personal information and/or tissue samples will either be destroyed or irreversibly de-identified.

Comments: If tissue/data already de-identified, how can it be destroyed or further dealt with?

Recommendation 13: We recommend that the government consider implementing a moratorium on the use of predictive genetic information for insurance purposes and appoint an authority to consider long-term implications of the accessibility of predictive genetic test results by employers and the insurance industry and to monitor developments in this area.

Comments: There is some concern that an employer or insurer seems to have some rights to personal information. Although various angles were discussed it appears that in the end they do some rights to it implicitly or explicitly!



SINGAPORE NURSING BOARD

26 July 2006

Associate Professor Terry Kaan
Chairman
Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way, #10-12 Helios
Singapore 138667

Dear Terry

REQUEST FOR FEEDBACK ON CONSULTATION PAPER
THE USE OF PERSONAL INFORMATION IN BIOMEDICAL RESEARCH

Thank you for inviting the Singapore Nursing Board to give its views on the paper.

We would like to congratulate the Human Genetics Subcommittee for drafting such a comprehensive paper on this important matter. The paper has covered all the important issues regarding the use of personal information in biomedical research.

Yours sincerely

Ms Ang Beng Choo
Registrar
Singapore Nursing Board

16, College Road, #01-01 College of Medicine Building, Singapore 169854 Tel: 6372 3082/3 Fax: 6221 1160

Feedback from SingHealth IRBs

24 July 2006

The SingHealth IRBs have read and discussed the 13 recommendations proposed by the BAC in their consultation paper entitled, "The Use of Personal Information in Biomedical Research". We present our feedback on the paper here.

Firstly, we would like to express our deep appreciation to the BAC for addressing very valid and vital issues in human subject research in Singapore. Establishing a legal framework to address these issues would greatly facilitate the IRBs in their review of research proposals and provide standardized practices throughout the Republic.

Recommendation 1: We recommend that the relevant authorities consider establishing a legal framework for the use of personal information in biomedical research.

Our Comments: The healthcare institutions in Singapore have been conducting research involving human subjects for a considerable number of years and are cognizant of the need to maintain the privacy and confidentiality of personal identifiable information collected in the course of research. The IRBs are currently drawing guidance from overseas legal frameworks, particularly the US CFR in addition to ICH and SGGCP guidelines. A legal framework which is relevant and customized for the Singapore research environment will be most appropriate and a step in the right direction to propel Singapore onto the world stage for human biomedical research.

Recommendation 2: Specific consent should be obtained when research involves identifiable personal information or tissue samples. General consent may be obtained for subsequent research involving the use of de-identified information or remnant tissue. The information to be provided to the individual when taking consent should depend on the sensitivity of the information and the risk of harm.

Our Comments: Irreversibly de-identified tissue and/or personal information obtained with a general consent will be of little value in some kinds of clinical research as further prospective data cannot be gathered. However, the majority of clinical research projects do not require identifiable information. Researchers can work with de-identified tissue or personal information and draw appropriate conclusions from aggregate samples. Under special circumstances, where the research findings would impact on the specific subject's health or well-being, the IRB would recommend the storing of reversibly de-identified tissue and/or personal information. The investigator, with the approval of the IRB, should have the option of making the tissue and/or personal information identifiable and obtain further individual consent to gather data and/or enroll the subjects in a prospective study, many of which are long-term follow up studies. However, there is a need for the identity part of the information to be kept by a separate body and released on a case-by-case basis upon investigator's request, duly approved by the IRB. We agree that, unless the IRB grants waiver of consent (where there is overriding public health benefit versus the risk of individual privacy), the investigator should obtain informed consent for the specific research study from

each of the patients and all arrangements should be made to allow the subject to refuse participation or withdraw from the study, and for destruction of all collected tissue or information for the particular subject.

Recommendation 3: We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to disease registries by health care institutions and physicians; and establish mechanisms enabling the registries and healthcare institutions to increase the accessibility of personal information for research that can significantly advance public welfare, while safeguarding privacy concerns.

Our Comments: Disease databases are a valuable source of information for conducting research of public health importance. Clinical research can benefit tremendously from long-term follow up of a cohort of patients. De-identified information stored in such a longitudinal disease database, should have provisions for re-identification, especially when there is chance that research outcome or projects can benefit existing patients in prospective studies.

Recommendation 4: We recommend that the relevant authorities consider establishing legal mechanisms to facilitate the use of personal information in registries, databases and medical records for epidemiological research and public health research. These mechanisms should also ensure that there is minimal risk to individual privacy and confidentiality.

Our Comments:
Legal mechanisms are needed to prevent abuses of privacy and confidentiality. Penalties must be swift, sure and severe to inspire public confidence in such data repositories. It is also the responsibility of PIs, IRBs and research institutions to safeguard the privilege and legacy of tissue and clinical material entrusted to us for betterment of mankind.

Recommendation 5: We recommend that the relevant authorities consider legal provisions necessary to ensure that the potentially increased scope of clinical audit does not violate medical confidentiality and to assure the public that privacy and confidentiality interests in personal information will be safeguarded.

Our Comments:
The Ministry of Health will need to advise on the specific areas within which it would like to conduct clinical audit. Since audit is for the improvement of healthcare system delivery and assessment of provider compliance and quality assurance, the law must provide for this function, and the scope and coverage of such audit clearly delineated. IRBs should focus on safeguarding research subject's interest. Clinical audit must be separately enforced through administrative and management mechanisms.

Recommendation 6: We recommend that IRBs, when reviewing research, ensure that any concerns in regard to vulnerable persons are appropriately addressed.

Our Comments:
IRBs currently use the vulnerable persons definitions adopted by the USA. However, the different cultural context makes the operationalization of concepts such as assent, challenging. We would like the BAC to bring in foreign IRB expertise to help local IRBs work towards developing relevant and implementable approaches to safeguard these groups of subjects.

Recommendation 7: Research participants should be allowed to withdraw their consent to participate in a research at any time without explanation and without prejudice. They should be assured that upon withdrawal their personal information and/or tissue samples will either be destroyed or irreversibly de-identified.

Our Comments:
We Agree. This is already practiced by local IRBs. The challenge is in the policing and surveillance to ensure compliance by PIs, especially those where there is pharmaceutical sponsorship and the tissue and information reside with these companies.

Recommendation 8: Personal information should be de-identified as far and as early as possible and should be stored or transferred as de-identified information.

Our Comments: We agree in principle. IRBs need sufficient resources and national level frameworks to allow reversible de-identification of clinical databases and tissue repositories. The identity and research information bits should be held by different discrete agencies to safeguard privacy.

Item 2.6 - mentions that confidentiality and privacy in research are "usually achieved by de-identification of the information". We would like to emphasize here, that the golden standards for clinical research are prospective studies and randomized controlled trials, and it would not be possible to use de-identified subject information in these situations.

Recommendation 9: Researchers should not attempt to identify an individual from de-identified information as it is a serious breach of ethics to do so.

Our Comments: We agree. Punishment must be swift, sure and severe to discourage abuse.

Recommendation 10: Irreversibly de-identified personal information generally need not be subject to privacy and confidentiality requirements.

Our Comments:
We Agree. Once the infrastructure for de-identification is set-up with separate data repositories, key coding agencies this can be implemented. The difficulty lies in rare clinical conditions within sub-specialties where small numbers of unique conditions lend the de-identified information to significant potential identification risk.

Recommendation 11: When reversibly de-identified information is used for research, IRBs should consider the adequacy of the extent and means of the de-identification in proportion to the risk. Should a person be identified from de-identified information, the person should still enjoy confidentiality and privacy entitlements.

Our Comments:
We agree in principle. The legal framework, resources and guidance must exist to help IRBs operationalize such entitlements.

Recommendation 12: The ethical principle of confidentiality should apply to the use of personal information from medical or public registries. Confidentiality safeguards should be commensurate with the potential risk of harm from inadvertent disclosure.

Our Comments:
IRBs need to be adequately resourced to help ensure compliance in the post-approval period. Resources for monitoring and external audit by CROs need to be put in place.

Feedback Pertaining to the Use of Personal Information in Biomedical Research

Feedback Pertaining to the Use of Personal Information in Biomedical Research

Recommendation 1:

Our Society is in agreement with the proposal that the relevant authorities consider the establishment of a legal framework regarding the access and application of personal information in biomedical research. Such a legal framework is not only appropriate but also highly necessary as extensive research is currently undertaken to advance the life sciences to alleviate human suffering by ameliorating disease treatment outcomes. This legal framework when accepted, will subject bioscience practitioners to undertake a professional responsibility to adhere to strict guidelines when accessing, managing and using personal information for their research without compromising the integrity and confidentiality of an individual. It also serves to legally protect the researcher and an individual.

Recommendation 2:

We agree that consent should first be obtained when biomedical research involves the use of identifiable personal information or tissue samples. In accordance to the definition of General consent in Para 4.2, our Society feels that an additional step should be provided to enable an individual to reaffirm his earlier General consent after a period of time lapse. This serves to better and more precisely inform the individual on the intended research currently at hand that requires an affirmation of the earlier General consent. Additionally, we are of the view that, regardless of the sensitivity of the information and the risk of harm, information should be provided unreservedly to the individual when seeking his consent since personal information is rightly his ownership.

Our Society also proposes that while there is good intention and reason to provide assurance in the proper use of personal information by empowering Institutional Review Board (IRBs) to approve the appropriate use of personal information to secure privacy and confidentiality of such information, we should incorporate an additional step to ensure non-biased jurisdiction over the use of the information by ensuring the implementation of a tripartite panel. This panel should comprise of foreign bioethics experts (with good professional track record and of international repute), Bioscience Non-Governmental Organisations (NGOs) and representatives from the relevant Government agencies. The role of such a tripartite panel is to ensure and provide a comparable and professional benchmark that is familiar to foreign collaborating bioscientists who may be engaged in joint bioscience research projects with our researchers. Additionally, this will also provide a further assurance of non-biased or abuse to personal information provided by individuals.

Finally, in Para 4.8, the use of a third party to obtain informed consent should be mandatory.

Society of Bioscience & Technology
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Recommendation 3

We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to disease registries by health care institutions and physicians; and establish mechanisms enabling the registries and healthcare institutions to increase the accessibility of personal information for research that can significantly advance public welfare, while safeguarding privacy concerns.

We have serious concerns with this recommendation as it is vague. By definition, disease registries deal with identifiable personal information. Making such information available to unspecified government entities raises serious consent and privacy issues. Would this mean for instance, that law enforcement agencies that we would not normally associate with medical research could obtain such confidential information?

Also, the BAC could go further towards the definition of the conditions under which privacy should be waived. Ideally, this should be achieved by a central body in Singapore and not for instance the individual IRBs.

We agree that seeking consent for the numbers of patients in a given disease registry may be difficult. However, we are of the opinion that they should be provided the choice to opt out of the research. That is, an explanative letter could be sent to them to inform them of their registration for the research in question and allowing them to opt out. This appears to have worked well for the purpose of organ donation and we are certain it can be successful in this particular instance.

Recommendation 6

On the point of proper protection of personal information for vulnerable persons, we are of the view that as we have earlier mentioned in our views for Recommendation 2, the formation of a tripartite panel will similarly extend the proper and more efficient safeguards to provide a non-biased jurisdiction of such personal information.

Recommendation 7

“Irreversibly de-identified” tissue can still be employed for research and/or commercial purposes. We are of the opinion that the patient should be allowed to dictate whether the tissue in question should be destroyed or irreversibly de-identified. Additionally, as in Recommendation 2, the affirmation step for an earlier provided General consent should be made available to enable the individual to re-consider his intentions based on a further knowledge concerning the more precise nature and objective of the research at hand compared to when he had first given a General consent at which time no specific research was then at hand.

Recommendation 8:

We corroborate that personal information should be de-identified as far and as early as possible and should be stored or transferred as de-identified information. In addition, we are also of the opinion that an independent agency or NGO is to be appointed to oversee the acquisition and de-identification process of acquired personal information whereby a benchmark audit should be implemented to determine and classify the level of security of personal information. Security auditors should similarly comprise of a tripartite panel to finalize and verify the adequacy of security for each stage of information acquisition and de-identification protocols that are implemented as well as to validate the competency of the security system in place. Manpower involved in the handling and the

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acquisition and de-identification protocols should be security vetted and subjected to legally bound confidentiality and secrets act to prevent possible leakage of invaluable personal information to commercial enterprises such as insurance companies.

Recommendation 10:

We do not agree with this recommendation as privacy or confidentiality should always be maintained regardless of it being irreversibly de-identified or not. Additionally, where enough information is amassed from a sufficient pool of statistical data, it could be exploited or abused. Thus, if this is not given similar treatment with all other personal information, there can be a loophole in a security system in place. As previously mentioned in our views for Recommendation 2, this jurisdiction should be managed by a tripartite panel similar to the treatment of all personal information.

Recommendation 13

Our Society perceives that it is important that the privacy and confidentiality of personal information be securely protected regardless of the pressures exerted by the insurance industry who has long lobbied for the disclosure of personal information by employing genetic advances to pursue selective discrimination. This issue however, would not be questioned some decades ago where current genetic advances are not even available for an industry to exploit in order to achieve self-interests and maximum benefits by indulging in selective discrimination.

It must be noted that should this be allowed in a particular industry, it would very soon proliferate and become a precedent for other industries to follow suit. Hence it will also become increasingly harder and extremely challenging to enforce or differentiate the need to maintain personal information as private and confidential; which would be better used if individuals do not suffer a stigma arising for exploitation or distrust but instead agree to the use of their personal information to benefit useful and meaningful biomedical research – which is the original intention.

Additionally, all the resources in terms of efforts and time that are employed to ensure a reliable system to assure individuals their privacy and confidentiality would soon be wasted when the general public develops a deep mistrust towards the system in place. Hence, our Society disagrees that the authorities be in any way supportive of commercial enterprises such as the insurance industry to use personal information (even if de-identified) via predictive genetic testing in association with commercial interests.

We urge the authorities to be focussed with regards to the objective in the use of personal information as rightfully themed in this feedback – for biomedical research.

- THE END -

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27 July 2006

Associate Professor Terry Kaan
Chairman
Human Genetics Subcommittee
Bioethics Advisory Committee
11 Biopolis Way, #10-12 Helios
Singapore 138667

Dear A/Prof Kaan

REQUEST FOR FEEDBACK ON CONSULTATION PAPER

Thank you for your letter dated 14 June 2006 in which you requested feedback from Tan Tock Seng Hospital regarding the consultation paper, "The Use of Personal Information in Biomedical Research", put up by the Bioethics Advisory Committee.

We gathered feedback from various groups in the hospital and found the paper to be well-written and a step in the right direction. We agree with many of the terms of patient privacy and confidentiality and also, the absence of these terms in irreversibly de-identified personal information. The paper also provides clearer guidelines and will give legal muscle to an organization as it releases information and/or asks for consent.

There are, however, a few specific points which we would like to highlight.

Pg 16 Para 4.3: *"...Even if information is de-identified, the individual concerned must at some point have consented to the use of his or her information in research unless such research falls within the limited exceptions discussed below."*

For research involving only casenotes review, there is doubt whether patients had given prior general consent for use of their information for such purposes. Would we thus be in breach if the information was released, even if it had been approved by the IRB and CMB/HOD?

Pg 19 Rec 2: *"... for subsequent research involving the use of de-identified information or **remnant tissue.**"*

This may give room for misinterpretation and may lead to unlimited use of these specimens for research use.

Pg 23 Para 4.25: *"...We consider it to be ethically acceptable for medical information to be disclosed by physicians to disease registries provided that ... patients are appropriately informed."*

There could be a problem with implementation if this was actually insisted upon. Whose responsibility would it be to inform the patient, meaning would it be the custodian or the requestor/disease registry?

Pg 25 Rec 3: *"...We recommend that the relevant authorities clarify the legal basis for the disclosure of medical information to disease registries by healthcare institutions and physicians; and establish mechanisms... to increase accessibility of personal information for research... while safeguarding privacy concerns."*

If that is all that is required, that privacy concerns are safeguarded, there should be no issue.

Pg 27 Para 4.39: *"...The Ministry of Health does not currently permit research access to information in the EMRX."*

The paper mentions that it may be a future possibility and that *"...ethical principles of informed consent and patient confidentiality would apply..."* This would be another implementation issue. Currently the system allows one to either see everybody or nobody. The IT audits must be more regular and stringent to pick up potential violators.

To add further, we would like to ask for suggestions on practical ways for compliance including the de-identification of personal biodata in databases. We would also appreciate guidelines for which information like this could be secured.

Another point to note, although "Biomedical Research" is stated in the title of the paper, the BAC also seeks to protect the confidentiality of information derived from audits.

Clinical Ethics

From the clinical ethics point of view, we would like to highlight some reservations.

Firstly, would such legislation actually be necessary? The matter of confidentiality has traditionally been a matter of ethics. Now the door would be open for laws to protect such information.

Secondly, the paper allows for the transfer of de-identified information without any need for an ethics review.

Thirdly, we would like to highlight the challenges that will be posed by the following paragraph regarding consent taking by the researcher who is also the attending physician. This was was mentioned in a previous BAC report on human tissue research and guidelines for IRB:

Pg 17, Para 4.8: *"...particular caution is necessary when the attending physician is also the researcher...patients may feel under obligation to their physicians...we recommend that the consent for research participation in such a situation be obtained by a competent third party."*

We recognize that this recommendation echoes the attempt by the Declaration of Helsinki to address the issue of coercion by dependent relationships and therapeutic misconception, where it is stated in clause 23 that:

Clause 23: *"....When obtaining informed consent for the research project the physician should be particularly cautious if the subject is in a dependent relationship with the physician or may consent under duress. In that case the informed consent should be obtained by a well-informed physician who is not engaged in the investigation and who is completely independent of this relationship."*

These are admirable research ethics standards. However, local factors such as culture and belief system of patients, and limited resources in investigator-initiated clinical studies would likely pose certain practical challenges if these ethical ideals were to be enforced as a legal standard.

Locally, most of our patients consent to participate in clinical studies due to their trust and confidence in their physicians. Having a 'stranger' take the consent will most likely result in many patients declining participation. Ironically, this very relationship that the doctor has with the patient, which causes ethical problems, is also a critical factor in enhancing trust and communication between the researcher and the subject.

Enforcing this ethical standard rigidly would mean that the budgeting of a clinical study will have to take into account the resources available to engage a "well-informed physician" who is not involved in the investigation and who is completely independent of this relationship. Not only must such a well-informed physician (i.e. one who is able to answer all the requirements outlined by these very guidelines and declarations) be available in the institution, he or she must practically and physically be available to take the consent on behalf of the PI. In these days when every minute of the time consumed by a "well-informed physician" to obtain this consent has to be accounted for, the cost of research will rise significantly, and this may retard the development of clinical research.

If this other "well-informed physician" is not available, and the only available physician is not "well informed", meaning he is unable to do a competent job in the consent process, fails to provide adequate information or clarification or makes unreasonable and unrealistic claims, it would lead to another ethical problem. This would be that of poorly obtained informed consent of questionable quality, which can be a far more serious problem. Furthermore, informed consent is a continuous process, with an ongoing communication between researcher and subjects as the study proceeds. It is questionable if this other "well-informed physician-consent taker" be always available.

Finally, one other point we would like to raise is the lack of clarity as to whether the recommendation on clinical audits include quality improvement initiatives. Many of such projects hover around the areas between clinical and health services research which can sometimes pose significant risks to the privacy and confidentiality of participants. Perhaps the BAC could consider recommending the establishment of IRB-like review bodies to handle the ethical aspects of such projects.

Lastly, as mentioned in your letter, the hospital is agreeable to having these comments published in your final recommendations to the Steering Committee on Life Sciences.

I hope we have been of help to your committee.

Warm regards,

A/Prof Philip Choo
Chairman, Medical Board
Tan Tock Seng Hospital

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