PUBLIC PERCEPTIONS OF BIOMEDICAL RESEARCH

A survey of the general population in Ireland

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Foreword

Today's health research is tomorrow's health care. So much of what we take for granted in medical diagnosis and treatment today – antibiotics, joint replacements, heart surgery, cancer therapy, pain control – is the result of research undertaken in the past by committed and farsighted health professionals and scientists, supported mainly by public bodies with an interest in improving health through research. Those undertaking and funding research depend on the good will and the active participation of the public in the task of pushing back the frontiers of knowledge and developing better ways of protecting health and treating disease. Maintaining and developing this engagement, at a time of major advances in science and great debate about the ethical issues those advances have brought in their wake, will be crucial to ensuring that health research and heath care in Ireland remain in the front rank.

This is why the Health Research Board welcomes the publication of this important study on Public Perceptions of Biomedical Research by Gráinne Cousins, Hannah McGee and colleagues at the Royal College of Surgeons in Ireland. It is the first survey of the attitudes of the general population to issues in biomedical research. Over 2,000 members of the public were asked their opinion about their willingness to donate a tissue sample for medical research, their views on procedures for informed consent to the use and storage of human tissue for medical research, their desired level of feedback on research findings to which they have contributed a sample and their awareness of and attitudes towards the retention of organs in the past.

The study reminds us of the many links that the population has with the health service. Over 80 percent of respondents had been treated in hospital and nearly 60 percent had been in hospital more than once. Perhaps because of their extensive engagement with the health service, participants were supportive of medical research, with high levels of willingness to contribute excess surgical tissue for research. These findings suggest that the public is committed to making a contribution to research for their benefit and for the benefit of future patients. It confirms the findings of the latest Eurobarometer survey that found that 93 percent of Irish citizens believe that medicine and new medical technologies will have a positive effect on our way of life in the next 20 years, a proportion that is similar to that reported for all EU member states[1].

The survey also points to the need for better communication between those engaged in research and the public they serve. A majority of those surveyed had not heard of any medical or health-related research conducted in Ireland in the previous three months and less than 10 percent had participated in a medical or health research study. Forty seven percent had heard of the Health Research Board and of those who had heard of the HRB, 66 percent had confidence in our ability to assess the benefits and risks involved in research. The survey also suggests that there is room for deeper and wider debate around the issue of consent and the identification of patient samples when donated for research. This is a debate to which the HRB would like to contribute in the interest of better health for all and is the reason we are pleased to assist with the publication and dissemination of this important study.

I would like to complement the Department of Health and Children for its foresight in commissioning this study and congratulate the team for the excellence of their research and analysis.

Professor Desmond Fitzgerald MD FRCPI
Chair, Health Research Board

[1]European Commission. Social Values, Science and Technology. Special Eurobarometer 225, June 2005

PREFACE

This study was commissioned by the Department of Health and Children. The Health Services Research Centre (HSRC) at the Department of Psychology, Royal College of Surgeons in Ireland (RCSI) designed and conducted the research. The study was completed between February 2004 and May 2005.

The project team comprised Ms Gráinne Cousins (B.A, M.Sc), Research Officer; Professor Hannah Mc Gee, Director of the Health Service Research Centre (RCSI); Dr. Ronán Conroy, Senior Lecturer, Department of Epidemiology and Public Health Medicine (RCSI); Dr. Lena Ring, Research Fellow (RCSI); Professor Elaine Kay, Department of Pathology (RCSI); Professor David Croke, Department of Biochemistry (RCSI); and Dr. David Tomkin, Senior Lecturer in Law (Dublin City University).

Professor Mc Gee and Ms. Cousins led the data collection, management and writing tasks. Dr. Lena Ring was an EU Marie Curie Host Research Fellow at RCSI during the project. The project was inspired in part by a similar Swedish project involving Dr. Ring and colleagues at Uppsala University, Sweden.

The study was completed in association with the Economic, Social and Research Institute (ESRI) Survey Unit. Thank you to Professor James Williams and Dr. Dorothy Watson for support and advice with this work. At RCSI, Dr. Ronán Conroy provided specific advice on statistical issues. Ms Fiona Mulvany and Ms. Ros Moran, Health Research Board, provided advice on topics to include in the survey.

Finally, we acknowledge the co-operation of over 2,000 members of the public who gave of their time and discussed their opinions with us. Without them, there could be no meaningful evaluation of contemporary attitudes to medical research.

The account as presented and inferences drawn are those of the authors.

EXECUTIVE SUMMARY

INTRODUCTION

- In an era of unprecedented development in scientific activity and possibility, public consultation on choices and directions for scientific, including medical research is essential. Recent advances in genetic and biomedical technologies have dramatically increased the scientific value of collections of human tissue for research and developments in the treatment of serious diseases have been greatly assisted by research using human tissue collections.

- Human tissue may be obtained after death or from living donors. Retention of organs and tissue for research can take place after death if relatives give their consent. For the living, samples of human tissue are often available after surgery. Not all of this tissue is needed for diagnosis and other clinical care and excess tissue samples from surgery may be stored as part of a patient's medical record.

- Evolving medical and ethical practice, alongside revelations of organ and tissue retention without consent following post-mortem, has led to calls for more stringent regulations regarding the use of human tissue in medical research.

- Current guidelines are principally drawn up by clinicians and legislative bodies with limited knowledge of the view of the wider public. Yet it is this general population that represents both potential donors of tissue and the funders of much medical research. Involving public opinion allows for more informed decision-making.

- In Ireland, in the context of an increasingly knowledge-focused society, financial support for health-related research has increased exponentially in the last decade. Yet little is known about the views of the public, in Ireland and elsewhere, on developments in science, medicine and technology which affect their lives.

- The aim of the present study was to provide the first nationally representative profile regarding public perceptions on use of human tissue in medical research in Ireland. Specifically, the research aimed to provide nationally representative data on:

    - Public willingness to donate a tissue sample for medical research

    - Public preferences for informed consent procedures in relation to the use and storage of human tissue for medical research

    - Public preferences for tissue storage (linked or unlinked model of storage)

    - Level of feedback on research findings considered desirable by the public

    - Public awareness of, and attitudes towards, the recent organ retention controversy

METHOD

- A cross sectional national telephone survey of the adult population (18 years and older) was conducted following ethical approval.

- 2,294 interviews were completed (967 men and 1,327 women). The overall response rate was 65%. Comparing international consent rates for public surveys, the response rate of the current study was the highest of which we are aware.

RESULTS

- The majority considered their health to be good or very good (62%), while 18% considered their health to be fair or poor. Thirty-three percent reported taking long-term prescribed medication at the time of the interview.

- The majority (89%) reported having had a blood test and 42% a tissue test other than blood at some point in their life. Of those who reported ever being a hospital in-patient (82%), the majority (58%) reported being a hospital in-patient more than once.

- Over a quarter (29%) reported that a post-mortem had been carried out on a family member. The family member concerned was often an immediate family member (59%): parent (33%), sibling (13%), child (8%) or spouse (6%).

- Forty-three percent reported that the hospital requested the post-mortem, 29% that the coroner ordered it, 6% indicated that their family requested the post-mortem and a further 21% were unsure. (These findings do not accurately reflect the ratio of hospital requested to coroner ordered post-mortems as the majority of post-mortems are carried out as part of the legal process to establish the cause of death under the auspices of the coroner. It is likely that such discrepancies emerged as the majority of coroner ordered post-mortems are carried out in hospitals).

- The majority of participants described the sensitivity of the request for consent for post-mortem as good/very good (77%) with 16% considering it to be poor/very poor. Of those personally involved in the decision to allow a hospital post-mortem, 64% indicated that the explanation given was good/very good. In contrast, 24% considered the explanation given as poor/very poor. Satisfaction with the explanation given in relation to a coroner's post-mortem was lower with 44% considering the explanation to be good/very good. Under one quarter reported the explanation given as poor/very poor.

- Regarding feedback to families on post-mortems, hospital requested post-mortems were viewed more favourably: 60% considered it to be good/very good. In contrast, 46% of those involved in coroner ordered post-mortems reported it as good/ very good.

- In relation to coroner ordered post-mortems, there were no significant differences in satisfaction when taking years since post-mortem into account. In contrast, satisfaction levels regarding explanations were found to be higher among those participants reporting a hospital requested post-mortem in the more recent past. For example, 75% of those reporting on a post-mortem conducted in the last 5 years considered the explanation they received as good/very good compared to 63% of those reporting on a post-mortem in the last 6-10 years, 62% in the last 10-25 years and 39% in the last 26+ years.

- Many participants who reported that a post-mortem had *never* been conducted on a deceased family member, indicated that they would consent to a hospital request to conduct a post-mortem on a family member (68% would do so). Nine percent indicated that they would not agree. This indicates a relatively high level of general public support for post-mortems.

- However, willingness to allow the use of organs or tissue of a deceased family member for medical research was lower with half (51%) supporting the use of such tissue. Twenty-two percent stated that they would not agree.

- The majority (74%) had not heard of any medical or health-related research conducted in Ireland in the last three months.

- The majority of participants had not donated blood in the past, with 34% reporting previous personal donation. There were no significant gender differences in donation. However, the likelihood of being a blood donor increased with age and level of education. Of those who had never donated blood (n=1,311), almost half (45%) indicated that they would be willing to donate in the future.

- Willingness to donate organs was not related to in-patient hospital experience (85% of those with hospital in-patient experience were willing compared with 88% of those with no prior in-patient experience).

- Six percent of participants reported that organs of a deceased family member had been donated for transplantation. The most frequently reported organs donated were kidneys (42%), eyes (32%), liver (26%) and heart (19%). Sixty-one percent of those with family experience considered the management of donation to be good/very good with 2% considering it to be poor or very poor (the remainder reported that they did not know how well the process was managed).

- The majority of participants (73%) reported that they would be willing to donate their own organs after death for transplantation. Twelve percent were unwilling and a further 15% were unsure. This is consistent with recent international surveys.

- Seven percent of participants reported being ever asked to take part in a medical or health-related research study before this present survey. Of those asked, 81% took part. The majority (91%) indicated that participation was unpaid. Research participation generally involved filling in a questionnaire (36%); taking medication (31%); being interviewed (29%); or providing a blood or a tissue sample (29%). Two percent of the overall population reported ever participating in a study which involved consenting to the use of blood or tissue samples surplus to clinical requirements. Almost all (94%) were satisfied with how the research was conducted.

- Consistent with this high level of satisfaction, 52% reported that their participation would make them more likely to take part in medical research again. Only 11% of these participants felt that their experience would reduce the likelihood of future participation with the remainder saying it had no effect.

- Almost three quarters of participants (74%) were unaware that blood or tissue samples are often stored as part of a person's medical record for their future care or treatment. Those who had previously had a test were more likely to be aware.

- Those surveyed were generally quite positive about genetic research while there were some reservations regarding the ethics of genetic research. For instance, consistent with generally positive attitudes to medical research, over 70% agreed that '*new genetic developments will result in cures for many diseases'.* In relation to the ethical question '*Is research on human genetics tampering with nature?*', results indicated some concern among the Irish public. A significant proportion (42%) felt that it was tampering with nature (in comparison to one third in a recent UK study).

- Participants also appeared to be well informed (i.e. less than 10% reported they had never heard of any of the listed forms of genetic research). Highest approval levels were reported for stem cell research using adult human tissue (49%) and for cloning human cells to combat disease (42%). Conversely, disapproval was highest for the development of genetically modified foods (52%) and stem cell research using human embryos (34%). A significant minority, from a quarter to a third, were undecided about each of these issues.

- Consistent with positive attitudes to medical and genetic research in general, only 10% felt that researchers were mainly motivated by selfish factors such as money or fame. Almost one third (33%) believed that researchers were motivated by altruistic reasons and a further 48% believed that they were motivated by both altruistic and selfish reasons.

- Attitudes concerning the ability of various Irish health-related governing authorities to assess the benefits and risks involved in medical research were evaluated. Forty-seven per cent of participants had heard of the Health Research Board, 49% had heard of the Irish Medicines Board and 35% had heard of institution-based research ethics committees.

- Participants had most confidence in the ability of *individuals*, in particular doctors and nurses (82%) and then hospital/university based researchers (70%), to evaluate the risks and benefits of medical research. Sixty per cent of participants reported having confidence in research ethics committees. Health boards and researchers in pharmaceutical companies received the lowest ratings, with over a quarter (28% and 26% respectively) not confident in their ability to evaluate risks.

- When presented with the hypothetical situation of having surgery and subsequently being asked if their 'excess' surgical tissue (i.e. material which was properly removed as part of surgery and which is surplus to that needed to be stored/tested for patient care purposes) could be used in a research study, the majority was willing to allow such use of their tissue (86%). This is similar to levels in recent international studies such as in the US and Sweden.

- Of those willing to allow use of their excess surgical tissue in this study, the most common motive was for the potential benefits there may be for the health of the participant's family in the future (96%), followed by the potential benefit there may be to one's own health (92%). A sense of duty as a citizen for the potential benefit of future patients motivated 80% of participants.

- Consent to allow the use of tissue for research purposes is generally obtained by doctors involved in the patient's care. However, this same doctor is often also involved in the research project for which consent is being sought. Consequently, patients may feel obliged to participate. This was not found to be the case for most participants. A minority stated that they would be motivated by a concern that their refusal to allow use of their excess surgical tissue would negatively affect their relationship with doctors or nurses (11%) or negatively affect their healthcare (15%).

- Factors associated with being willing to allow use of excess surgical tissue for research included higher level of education, having children, willing to donate organs for transplantation, awareness of tissue storage as part of one's medical record, positive attitudes towards medical and genetic research, believing that researchers are primarily motivated by altruistic reasons and feeling a sense of duty as a citizen for the potential benefit there may be to future patients.

- Of those who reported that they were willing to allow their excess surgical tissue to be used for research purposes, 87% were also willing to allow this tissue to be stored for future research. Participants were then informed that tissue samples may be stored as linked (patient is identifiable) or as unlinked (no link between sample and patients identity is possible) samples. Half of those willing to allow their tissue to be stored for future research reported a preference for a linked model of storage, 22% for an unlinked model and 28% had no preference. Willingness to allow tissue samples to be stored under a linked model was considerably lower among the Irish public than a recent comparable Swedish study (where 86% would consent under a linked model (Lindblad et al. 2004)). In the present study, the value of linked samples was explained briefly to those who indicated that they would prefer an unlinked model or had no preference. With this additional information regarding the benefit of a linked model, 77% of those who initially had no preference or chose an unlinked model, indicated that they would be willing to allow their tissue to be stored under a linked model. Thus overall 89% (almost identical to Sweden) were willing to agree to linked model tissue donation. These findings suggest that when members of the public are provided with information about the benefits of being able to link tissue samples to medical records, they are willing to allow their samples to be stored under a linked model.

- Participants were also asked to consider a hypothetical situation where they allowed blood or tissue samples to be used for research. The majority (69%) indicated that they would like to receive general information on study findings while 17% would not like to be informed. This is consistent with other recent international studies. There was however a stronger desire for information regarding one's own genetic risk for an inherited disease, with 83% reporting that they would like such information and 8% not wanting to be informed. Seventy-one percent reported that they would still like feedback even if the disease was not preventable or treatable with 18% not wanting information in such circumstances. These findings are in contrast to international studies, which report a lower desire for feedback when the disease was not preventable or treatable (e.g. a Swedish study found that 44% wanted information only if the disease was preventable or treatable (Ring & Lindblad 2003).

- Much of the ethical debate surrounding informed consent procedures centres around the necessity for informed consent for re-use of stored tissue for research purposes. This study proposed three possible options for participants: being asked for permission to use one's stored tissue before each study (specific consent); being asked for permission to use stored tissue once only, with subsequent studies needing ethics committee approval but not individual consent (general consent); and being asked at the outset whether one wants to provide general or specific consent (personal choice). In this study, a slight majority favoured general consent (44%) followed by specific consent (36%). Personal choice was considered desirable by 16%.Those who indicated personal choice were then asked what their own preference would be if they had to decide. Taking these answers into account, just over half the sample (51%) supported general consent, 43% supported specific consent and a further 6% were unsure. These findings are consistent with international findings that members of the public are likely to have conflicting attitudes to the necessity of specific consent.

- Willingness to allow use of surgical tissue for research was not associated with preference for either types of consent. However, the organ retention controversy appeared to influence participants' judgments regarding consent preferences. Specifically, those who had more confidence that the events of the organ retention controversy are "a thing of the past" and "unlikely to happen again due to the adequacy of current safeguards", were significantly more likely to favour general consent (60%) compared to those who believed "it could happen again in the future" (49%).

- There are various circumstances where it is unclear what type of informed consent is necessary. These include when a person who originally allowed tissue to be stored for research is no longer contactable (including where the person has died or moved address without leaving contact details). Over half (55%) considered it acceptable to use stored tissue under such circumstances, a further 31% considered it unacceptable and 14% were unsure. Two recent Swedish studies yielded similar results.

- Ireland has witnessed a high level of media coverage of the organ retention controversy. However at the time of the survey (second half of 2004, early 2005) the Dunne inquiry was ongoing. One objective of the current study was to determine public awareness, level of engagement and attitudes towards the organ retention controversy and to identify the relationship of this issue to public confidence in the healthcare system.

- The majority of those surveyed (94%) indicated that they had heard of the organ retention controversy. Similarly, the majority (95%) reported reading newspaper articles or listening to radio reports about this issue. However, just over half (53%) reported that they had discussed this issue with others. It appears that the Irish public were more informed than the British public, as only 34% of participants in a UK study (N=1,800) reported being aware of the organ retention controversy (Retained Organs Commission, 2003). However, the UK study included younger participants (aged 15 years+) whereas the current study sampled participants aged 18 years and upwards. Furthermore, it is likely that Irish study participants were more exposed to media reports as the study was conducted one year after the UK study. Despite high levels of awareness among the Irish public regarding the controversy itself, less than half the participants (44%) had heard of the Dunne Inquiry.

- Asked whether they felt that such events were the result of a lack of safeguards in the past that would not happen again vs it could happen again in the future because there are not enough safeguards, 46% were not confident that there are enough safeguards to prevent such outcomes from occurring again. One in three believed that there are now enough safeguards with a further 20% unsure.

- About a quarter (24%) felt that doctors in organ retention situations failed to ask for consent because they did not want to cause further upset to the family; 51% believed they did not want the added trouble of having to ask the family 25% were unsure. Disposal of organs without asking the family's wishes and the fact that most cases involved children were considered the most problematic aspects of the issue with 83% identifying them as a major problem.

- Regarding responses of hospitals and the Department of Health and Children when the controversy was uncovered, 78% were dissatisfied with the response of the hospitals concerned and how they dealt with the families involved. Similarly, 70% considered the response of the Department of Health and Children as unsatisfactory. In contrast, 50% considered the media coverage of the controversy as satisfactory with 30% considering it to be unsatisfactory.

- Despite largely negative attitudes towards the response of the hospitals and the Department of Health and Children, less than half (42%) felt that families who had organs of a deceased relative retained without consent should be financially compensated for the distress caused. Over a third (37%) believed they should not be compensated and a further 21% were unsure.

- Public confidence in their family doctor was least affected by the controversy, with 5% saying that their confidence had been affected. This was followed by hospital doctors (25%) and researchers (26%). Interestingly, confidence in pathologists was not as affected as might be imagined, as less than one third agreed that their confidence had been affected. Public confidence in the Department of Health and Children (41%) and managers at hospitals (40%) appears to have been most affected by the controversy.

DISCUSSION

- This is the first such engagement of the general public in Ireland on medical research and related issues. As an activity supported to a large extent by public funds, Irish research aims to contribute to the international effort to improve the health and well being of humankind. Research from the perspective of the individual participant is largely an altruistic activity. As all research participation is voluntary, it is therefore also a very fragile and valuable collective commodity. Without voluntary participation by individuals, there can be no research.

- The current report provides the first evidence on current issues in the research setting. It thus provides a first important barometer of public views on research challenges in contemporary Irish society.

- Many of those interviewed had engaged with the healthcare system and reported various healthcare experiences such as blood tests, tissue tests and being a hospital in-patient. Participants were generally quite supportive of medical research, with high levels of willingness to contribute excess surgical tissue for research and storage. Similarly, the majority would consent to a post-mortem of a family member.

- These findings suggest that the public is generally aware of and committed to making a contribution to research and related activities in the healthcare system for their benefit and for the benefit of future patients.

- However, the potential for misperceptions regarding various medical processes was repeatedly highlighted throughout the study (e.g. in relation to genetic diseases and hospital or coroner requested post-mortems). These findings highlight the need to be clear in both research and clinical situations regarding the use of terminology. The challenges to researchers in this area reflect confusion on the part of the public and a need for clearer communication on health issues by all concerned with the public.

- It was clear that the public are less willing to allow the use of tissue or organs from a deceased relative than they are to allow their own excess surgical tissue to be used. Further research is necessary to identify the symbolic differences between tissue from the living and from the dead. Furthermore, publicity to highlight the importance of signing a donor card and discussing organ donation with family members is needed to guarantee that organs are donated as intended by the deceased.

- Finally, in relation to preferences for consent procedures, findings were equivocal with similar proportions supporting either general or specific consent. This study thus informs and can help to set an agenda for further communication with the public.

- These conclusions and recommendations are made in a very fluid context of increasing public awareness of dilemmas in health-related research and in the context of rapidly changing frontiers in scientific and healthcare practice. Ongoing information, education and evaluation is needed to enable the dialogue necessary among the widest public audience, professionals and policy makers. Ultimately, research in the health context is itself a public resource. The public good that can be achieved through research can only develop and prosper through increased dialogue among all of the relevant stakeholders. The findings of this study provide one heretofore unavailable perspective on contemporary health-related research issues in Ireland – that of the wider general public. It is hoped that it will form the first component of an ongoing dialogue to foster research as a core activity of, and for the greater good of, the Irish and wider general public.

TABLE OF CONTENTS

1. INTRODUCTION

1.1 General introduction

Contemporary society is one of increasing transparency. Access to knowledge and to decision-making for an ever-widening sector of society is a marker of this era. Access to the Internet and to the process of consultation is transforming public awareness and debate on issues which were heretofore the preserve of professionals and other gatekeepers in society. Nowhere is this more evident than in the area of science and medicine. The public is now less deferential to experts and authorities at a time when the future possibilities for science and technology have expanded at a rate unparalleled in the past. Society faces a "crisis in science and its governance" (Wooding, Scoggins, Lundin and Ling, 2005). Serious ethical issues such as those concerning genetic testing, stem cell research and cloning are to the fore while many high profile controversies (such as organ retention, MMR vaccine, BSE ('mad cow disease') and genetically modified foods challenge public confidence in the methods and possibilities of science. As recently highlighted in the UK House of Lords report '*Science and Society*' (2000), these issues point to the increasing need for real dialogue between 'science' and the public.

A process of public consultation has emerged in the last decade. For example, a Rand report (Wooding et al 2005) outlines recent cases of public consultation by government or regulatory authorities in the UK. These included consultation on biobanking (storing human tissue for medical research); on a low carbon economy; on sex selection for family balancing in pregnancy; on the management of BSE in sheep by the authorities; and on methods of food production and preparation. In Ireland, there has been an increasing trend toward public consultation, for example, through open meetings and government requests for submissions on issues from interested groups. This is increasingly the case when health and other government strategies are being developed. New strategies on information are, in parallel, central to these developments. This report considers the challenges facing Irish society in relation to medical research. The particular focus is the challenge of conducting research involving human biological tissue and the wider context in which this occurs. The aim of the report is to outline some of the concerns involved to describe public awareness as known from mainly international studies; and to report on the process and findings of a first general population study on these issues in Ireland.

1.2 Research on human biological tissue - Emerging ethical debate

Recent advances in genetic and biomedical technologies have dramatically increased the scientific value of collections of human tissue for research. Developments in the treatment of diseases such as heart disease and cancer and in understanding threats to human health such as AIDS and variant CJD have been greatly assisted by research using human tissue collections (UK Department of Health Interim Report: Clinical Ethics and Human Tissue Branch, 2003).

Human tissue may be obtained after death or from living donors. Retention of organs and tissue after death is permitted in two main circumstances: after a post-mortem examination ordered by a coroner, in which case retention is only permissible for the purpose and time necessary to establish cause of death; and after a hospital post-mortem, where retention for research can take place if relatives give their consent. However, human tissue from living persons is considered to be of greater scientific value than is post-mortem material. Firstly, possible sample access from living donors vastly outnumbers post-mortem specimens. Secondly, the absence of autolysis[1] makes tissue from living donors technically preferable for research (Furness, 2003). Diagnostic and therapeutic surgical procedures often yield samples of human tissue. Not all of this tissue is needed for diagnostic confirmation. Excess tissue samples from surgery are generally stored in the form of slides and paraffin blocks as part of a patient's medical record, allowing for future reassessment of diagnosis, for clinical audit and for the application of new diagnostic techniques as they become available (Burton and Wells, 2002). Consent for storage in this instance is implicit in the consent obtained from patients for the diagnosis and treatment of their disease or illness (Van Diest, 2002). However, a dilemma emerges regarding retention of human tissue which is surplus to clinical requirements: should it be disposed of or retained and stored for research purposes?

The increasing scientific value of stored human tissue has given rise to a debate about whether investigators should be required to obtain consent from individuals before conducting research on stored samples (Wendler and Emanuel, 2002). In the past, excess tissue stored during the course of diagnosis and treatment was made available for medical research without the specific consent of the patient from whom the tissue was removed (Start, Brown, Bryant, Reed, Cross, Kent and Underwood, 1996; Prime,

Sobel and Herrington, 2000). This was done in the absence of legislation governing the uses of human tissue removed from living patients. More recently, a Nuffield Council of Bioethics Working Party (1995) examined ethical and legal issues in relation to human tissue not covered by specific regulation or legislation in the UK. The Working Party concluded that tissue removed with consent during the course of treatment should be regarded as having been 'abandoned' and concluded that this tissue could be archived and subsequently used in research approved by an appropriate research ethics committee (Nuffield Council of Bioethics, 1995).

However, more recently, revelations of organ and tissue retention without consent following post-mortem led to calls for more stringent regulations regarding the use of human tissue in medical research. These revelations were publicised in the UK following the Alder Hay and Bristol Royal Infirmary Inquiries (2001), which investigated the removal, retention and disposal of paediatric organs and tissue following post-mortem examinations. Both inquiries concluded that organs were often removed, retained and disposed of without prior family consent. Similarly, the Isaac Report (2003) stated that thousands of brains had been removed during post-mortem examinations and retained for research over the past 30 years without prior family consent. Ireland has since witnessed similar revelations regarding the removal, retention and disposal of human organs, particularly those of children, following post-mortem. This practice has been the subject of substantial media attention. Awareness of the practice has given rise in this country to varying reactions from support groups involving parents and next-of-kin. These cover the spectrum of deaths in this area including peri-natal, paediatric and sudden infant deaths. The matter has been investigated by a government-established investigation, the Dunne Inquiry. This non-statutory inquiry was established in 2000 and was concluded by the Tainiste and Minister for Health & Children in March 2005. A final report is being prepared by barrister Dr Deirdre Madden.

Conclusions from the UK inquiries demonstrate a breach of the 1961 Human Tissue Act, particularly in respect to retaining tissue and organs beyond the time necessary to establish cause of death following a coroner's post-mortem. According to the UK's Chief Medical Officer (2001), the law was poorly understood and custom and practice developed within a framework which relied too heavily on "traditional and paternalistic attitudes in which the benefits of research were seen as self-evident truths and feelings and wishes of individual parents and families were not sufficiently recognized" (p.35).

The organ retention controversies referred to above have stimulated much debate regarding the need to establish new regulations for the use and archiving of human tissue for medical research. This debate has been further complicated by the fact that recent advances mean that tissue collections have evolved into genetic (DNA) databases allowing unprecedented examination of genetic aspects of human functioning (Grody, 1995). However, drafting guidelines for research using human tissue must address the fundamental problem of balancing public gain from research and the moral rights to autonomy and respect for the individual. Ashcroft (2000) claims that such a balance is only possible through a process of social choice about which should take priority, all things considered. Such a process is not free of costs. Thus before any regulations are decided upon, it is advisable that there is widespread debate to consider the practical, ethical and legal implications of generating, storing and using collections of human biological material for research.

To date, the debate in professional settings has focused on the issue of informed consent as this is the cornerstone of ethical experimentation on human research participants. The primacy of informed consent was established by the Nuremberg Code (in 1947) and built on by the Declaration of Helsinki (first in 1964 and now with several updates). This Declaration asserts that research participants must give their voluntary consent after being informed of the objectives, methods and possible benefits and risk of the investigation (and also of any possible disadvantages involved in the research and of their right to withdraw from the study at any time). The application of these guidelines to the use and storage of human tissue for research is considered positive by libertarians as it respects the individual's autonomy and promotes self-determination. Savulescu (2002) argued that the act of seeking consent may also promote public confidence in medicine and research. This may be important in light of recent organ retention controversies which have been seen as leading to widespread suspicion and erosion of trust in the honesty of the medical profession (Retained Organs Commission, 2002). However, on the other side the utilitarian argument is that recommendations such as the Declaration of Helsinki do not translate directly to research involving human tissue, as the Declaration refers to research "on" humans, and research "involving" human participants. Many argue against the model of adopting consent to participation in clinical trials as a model for research on human tissue, as the patient is not physically present and use of these samples does not involve any physical risk to the patient (Regidor, 2004; Fureness, 2003).

One of the questions central to this discussion is whether *specific* consent is necessary or whether *general* consent is acceptable, when obtaining and storing tissue from living sources for research.

General consent refers to patients giving 'blanket' or unspecified consent to use their tissue for a broad category of research without knowing the details of each project that may use the tissue. Specific consent, on the other hand, requires the donor's consent for each specific research project using the individual's tissue (Prime, Sobel and Herrington, 2000). Because science is developing ever more rapidly, tissue samples stored for one purpose may later prove useful for research that could not be envisaged at the time samples were taken. Advocates of specific consent argue that it is necessary to contact donors each time their material is used for research purposes, so that they can give their informed consent. Savulescu (2002) argued that people may have values that differ from research goals and that they have a right to prevent their tissue being involved in such research, e.g. an individual might be willing to have his/her tissue used for general cardiac studies but not for research on genetic aspects of cardiac function. Additionally, he argued it allows sensitivity to cultural values. Similarly, Ashburn, Wilson and Eisenstein (2000) argued that human participants have a right to voluntarily consent to participate in medical research after performing their own risk-benefit analysis based on full information. This is not possible if general consent is used as a model. However, as the UK Medical Research Council (2001) note, it is not always possible or practical to go back to a donor for new consent, for example if the donor is deceased or has moved with no forwarding address. This has led to discussion about the potential of general consent as an alternative for the use of tissue from living patients for research. Some argue that the requirement for specific consent tips the balance too far toward individual autonomy (at the expense of the rights of society as a whole) given the potential benefit from the use of human tissue collections as a research resource (Grody, 2003). Fureness (2003), for example, argued that requiring specific consent from every patient takes due account of the autonomy of the few who object. However, it disrespects the autonomous wishes of the many who want to help medical research but who cannot be contacted. He also maintained that those who would benefit from the proposed study are damaged. In the absence of explicit consent, can the only alternative be disposal of the tissue? Jones, Gear and Galvin (2003) suggested that disposal is not a neutral action, since it presupposes that disposal is preferable to its use for research purposes. They argued that even if disposal demonstrates respect for unknown patients in the past, it achieves this by accentuating the burden of illness on current and future patients. However, recent guidelines from the Council of Europe report that research on a person should not be carried out without informed specific and documented consent of the person (Council of Europe, 2005).

Potential practical problems of requiring specific consent for use of human tissue from tissue collections may be examined in the light of recent problems experienced following the requirement of informed consent for participation in disease registries. Disease registries attempt to include information on all those who have received a diagnosis and/or treatment for a specific condition. Such databases have been used to examine how care is delivered and the outcomes received. Concerns about privacy have meant that several countries have passed legislation to protect personal information from unauthorised use. However the introduction of privacy legislation mandating informed consent for access to medical records has adversely affected cancer registries in England and Germany (Tu, Willison, Silver, Fang, Richards, Laupacis and Kapral 2004). An example of the impact on registries is provided by the experience of a Canadian stroke registry. Tu et al examined the effectiveness of attempting to obtain informed consent for participation in the registry of the Canadian stroke network. Only 39% of patients in phase 1 and 51% in phase 2 studies provided consent for their inclusion in the registry. The authors concluded that requiring written informed consent led to a selection bias, such that patients who were more seriously ill or impaired were excluded from the registry. This sampling bias reduced the usefulness of the data for monitoring and planning health care delivery. Additionally, almost $500,000 of the approximate $2 million spent on the registry between June 2001 and May 2003 was spent on consent-related issues alone. Tu et al (2004) suggested that collecting de-identified data from all patients' medical records circumvents the necessity of mandatory informed consent provided appropriate confidentiality safeguards are in place. They argued that any concern regarding access to medical records without consent should be balanced against the potential harm to future patients, if they are given an incorrect prognosis (based on data from a consent based registry, which is limited due to a selection bias). Similarly, Ingelfinger and Drazen (2004) argued that public health is threatened more by incomplete data than individual privacy is by disease registries. McKinney, Jones, Parslow et al (2005) describe similar challenges in obtaining consent for submission of patient identifiable data to a national paediatric clinical audit database in the UK. Overall, consent was obtained for 43% of admissions across five units.

The use of anonymised samples[2] as a means of eliminating the necessity of informed consent has also been debated in relation to the use of human tissue in medical research. Following a consensus process involving scientists, ethicists, lawyers and consumers, Clayton, Steinberg, Khoury, Thompson, Andrews, Kahn, Kopelman and Weiss (1995) concluded that informed consent is not necessary for anonymous samples. Similarly, the view of the American Society of Human Genetics is that anonymising samples protects sources from risk and thus eliminates the need for recontact to obtain informed consent (Wendler and Emanuel, 2002). The US National Bioethics Advisory Commission (1999) also concluded that research on already existing unidentifiable specimens should not be classed as research with human

participants, arguing that neither informed consent nor ethics review is required. This was based on the view that research using human participants involves an intervention or interaction with a living person. It was felt that restrictions imposed on the use of stored anonymous tissue could seriously hinder potentially valuable research projects (Jone, Gear and Galvin, 2002). On this basis, some argue that researchers do not need to obtain consent for research on stored samples that will be stripped of personal identifiers (Wendler and Emanuel, 2002). However, critics claim that this view misunderstands the reason for obtaining informed consent, i.e. to allow the individual to control whether his or her samples are used for research purposes. Additionally, while anonymisation helps protect patient privacy, it leaves physicians with the ethical dilemma of not being able to disclose information that the patient might like to have and/or from which he or she could potentially benefit Grody (1995).

Furthermore, advances in knowledge of the causes, clinical characteristics, and prognosis of diseases following certain treatments would be impaired if researchers were unable to link biological samples back to individual medical records. As Beskow, Burke, Merz, Barr, Terry, et al (2001) suggested, storing remaining biological material under a linked (or 'patient identifiable') model[3] enhances its research value as it can link it with other clinical and epidemiologic data.

1.3 Public participation

If this debate is to act as a process of social choice arriving at balanced regulations, who should be the primary actors in such a process? Current guidelines are principally drawn up by clinicians and legislative bodies with limited knowledge of the view of the wider public (Goodson and Vernon, 2003). Yet it is this general population that represents both potential donors of tissue and the funders of much medical research. Learning about public opinion allows for more informed decision-making. Such public participation is advocated as essential for the provision of a comprehensive basis for the planning and evaluation of health services (Health Information - National Strategy, 2001). Having reflected on the debate in the academic context, there are a number of alternate suggestions regarding best practice on informed consent procedures. However little is known about the views of the public. Unanswered questions include those about the necessity of informed consent for re-use of archived tissue for research purposes. Do the public feel that general consent is sufficient or do they support the idea of specific consent? Alternatively, do they feel that each individual should decide whether they want their sample stored under general or specific conditions? Does this alternative allow for a sufficient level of autonomy in deciding whether one's sample is used for research rather than discarded? Furthermore, do the public require their samples to be stored anonymously, or are they willing to allow their sample to be stored under a linked model to allow for cross-reference between the sample and medical records? What consent procedures do the public think necessary for the use of archived samples from deceased donors? Knowledge of potential donors' perceptions regarding these questions is invaluable in developing informed consent procedures for use of human tissue surplus to clinical requirements in medical research. Furthermore, studies have shown that the public consider their participation in this debate as important (Ring and Lindblad, 2003; Hoeyer, Olofsson, Mjörndal and Lynöe, 2004).

1.3.1 Consent preferences: general versus specific consent

Relatively few studies have examined public perceptions of informed consent. Those that have have tended to focus on participants' preferences for general versus specific consent, particularly in relation to the use of archived (i.e. stored) samples for research purposes. However, these studies have yielded equivocal results. At a more basic level it would appear that there is little public awareness that some tissue samples may be stored for future care and treatment (Ring and Lindblad, 2003) or that excess surgical tissue may be stored for research purposes (Medical Research Council (MRC) and the Wellcome Trust, 2001). Lindblad et al (submitted for publication) found a higher level of awareness of the storage of samples for future care and treatment (23%) than for research purposes (14%) in their national study of 2,298 Swedish participants.

In relation to the process of informed consent, Corbie-Smith , Thomas, Williams, and Moody-Ayers (1999) found that the majority of African Americans in their focus group study had a limited understanding of this process, and generally perceived signing the consent form as relinquishing their autonomy and as a means of protecting hospitals and doctors from legal responsibilities. Similarly, an Italian study regarding primary care patients' knowledge of informed consent for participation in a medical trial concluded that participants' knowledge of the meaning and value of informed consent was generally poor (Dazzi, Agnetti, Bandini, Corradini, De Giovanni, Ghillani, Giacomi, Negro and Pezzarossa, 2001). However, the MRC and Wellcome Trust (2001) focus group study reported that participants saw the consent process as a sign of respect for the participant.

Support for specific consent was found in Goodson and Vernon's (2003) study of 100 healthy volunteers in a UK dental practice, with 42% reporting that they would want to be informed if their tissue were going to be stored after donation. Additionally 35% would want to be consulted if their tissue were to be used in the future. Similarly, in a study of a Jewish population in the US, Schwartz, Rothenberg, Joseph, Benkendorf and Lerman (2001) found that the majority of participants considered written informed consent as a necessity before using stored biological samples for genetic research. The UK Human Genetics Commission (2001) conducted interviews with 1,038 members of the People's Panel, to determine the public's attitude to human genetic information. The issue of consent was found to be of great importance to the public with nine in ten participants reporting that permission should always be sought prior to blood or tissue being used in genetic tests. A further four in five participants felt that specific consent should be required before each new research project is conducted on existing samples.

Similarly, the MRC and Wellcome Trust (2001) focus group discussions with members of the public found that informed consent about how samples would be used was seen as essential. However, the mechanics of securing consent for future use was considered problematic. Some participants favoured specific consent in the event of their sample and information being used in new or different ways than they originally agreed. Others were less concerned about consent in this context and felt it would be impractical to contact people before each new study using their sample. These participants advocated a general consent statement to cover all future research. Asai, Ohnishi, Nishigaki, Sekimoto, Fukuhara and Fukui (2002) reported on a focus group study of the Japanese public and physicians. They concluded that the public are likely to have conflicting attitudes towards the necessity for the specific form of informed consent and the use of archived samples, with some participants willing to allow their archived samples to be used without consent and others requiring consent prior to study commencement. Three preconditions were considered necessary before researchers could have access to samples for research without obtaining specific informed consent from participants. These were the protection of a participant's privacy; maintaining confidentiality; and communicating the outcomes of studies to research participants.

Studies which found a relatively strong public preference for specific consent for the use of samples indicate a desire by the public to retain ongoing control over their tissue after donation (Goodson and Vernon, 2003). This view is contrary to the conclusion of the Nuffield Council (1995), which asserted that a patient's consent to the removal of tissue implied consent to its subsequent use for any ethically acceptable purpose. This conclusion is supported by Start et als'. (1996) study of 384 postoperative patients in the UK regarding ownership and use of excess surgical tissue. Only 10% of patients believed that they retained ownership of tissue removed at surgery, and 27% believed it belonged to the hospital. Another 27% believed it belonged to nobody and 20% believed it belonged to the laboratory. Additionally, the majority of patients supported the use of surplus surgically removed tissue for research purposes. The authors concluded that specific consent would seem unnecessary and impracticable, particularly in relation to samples stored anonymously in pathological archives and in residual tissue banks. Furthermore, they argued that stored material cannot be sensibly subject to specific informed consent, as the specifics of future studies are unknown at the time of storage. While the MRC and Wellcome Trust (2001) focus group study yielded similar results in relation to public perceptions of excess surgical tissue, they found that many participants distinguished between healthy and unhealthy (surgical tissue) material. They felt that if the tissue sample is still healthy and potentially useful to them they should be asked for their consent to give it away. In contrast, excess surgical tissue was not viewed as the patient's property as it has already been discarded. There was also the view that the use of excess surgical tissue in research is almost a *quid pro quo* for treatment, i.e. since the doctor helped the patient by removing something bad, the doctor in return could use this material for their own purposes.

Preliminary results from a pilot study of the Swedish public's perceptions of informed consent and archived samples support the concept of general consent (Ring and Lindblad 2003). They found that 46% of participants felt there is no need to be asked for informed consent in relation to new projects that have research ethics committee approval. In contrast, 18% wanted to be asked for consent if the purpose of the new study is different from the original purpose and a further 18% considered consent necessary for all new research studies. A somewhat contradictory finding was that 68% of the same sample indicated that they would feel respected if they were asked for informed consent in relation to every new project, compared to 25% who thought it would be a waste of resources that should be invested in research. Other empirical studies which demonstrate the acceptability of general consent include a Swedish study by Stegmayr and Asplund (2002) which sought consent for genetic research on blood samples collected more than a decade earlier. Almost all (93%) eligible participants gave their consent for their blood sample to be used for academic genetic research, provided an ethics committee had approved the research. This figure represents 88% of the original tissue samples. However only 22% wanted to be informed about and give new consent for each new genetic study. The remaining participants gave general consent to genetic research provided an ethics committee had approved the research. Whilst indicating a preference

for general consent, it simultaneously highlights the feasibility of contacting patients ten years after their donation as, of the initial donors, 93% were alive and possible to locate. However, the samples were donated in 1990 as part of the World Health Organisation's MONICA project, a very well publicised project which examined cardiovascular risk factors [a topic with low expected early mortality]. Thus, caution must be applied in generalising the ease of re-contacting participants in less publicised projects. There is little evidence of the general feasibility of re-contacting people more than a decade later for research. Furthermore, these results may not represent attitudes of the general public towards research using stored tissue, as the proposed purpose of follow up research was for cardiovascular diseases only and participants had a long-standing relationship with researchers (Hoeyer et al. 2004).

Similarly McQuillan, Porter, Agelli, and Kington (2003) revealed that 84% and 85% of participants in 1999 and 2000 respectively consented to having their blood specimen included in a national repository for genetic research in the US. Participants consented in the knowledge that researchers using their samples would not contact them again. These figures can be interpreted as acceptance of general consent for the use of archived samples in genetic research. Both samples were taken from a cross-sectional National Health and Nutrition Examination Survey of US households. A recent Swedish survey of public attitudes to tissue donation for genetic research, demonstrated public acceptance of general consent, provided each specific study had research ethics dapproval (Hoeyer et al 2004). They asked the public whether there are "*occasions when a research ethics committee may decide whether to approve use of your tissue in a research project without you being asked personally*?" (p. 226). The majority of participants agreed that a research ethics committee could decide (67%) with a further 22% reporting that they or a relative should always be approached. The most frequently endorsed situation for allowing the research ethics committee decide, included having provided permission to use the tissue in other research projects (79%); if the sample was an old, clinically derived sample (60%); or if it was difficult to contact individuals for consent (52%). Despite this apparent acceptance of general consent, 48% of participants reported that they would feel respected if asked for their consent before every study using their sample and only 28% considered it a waste of money.

Hoeyer et al (2004) also hypothesised on potential practical limitations of requiring specific informed consent. The authors split their sample into immediate (responded to the initial questionnaire or the first reminder) and late (responded to the third or fourth reminder) participants. Late participants were more likely to indicate that they were against the use of a donated tissue sample for genetic research and were significantly less likely to consider expressing their opinion on medical research using human tissue as important. The authors concluded that this group may also be less inclined to respond to specific consent sheets for each new project using their tissue, thus resulting in a drop-out rate for medical research. Such a drop-out rate could be due to a combination of a lack of interest and a negative attitude toward research in general as distinct from being a refusal to contribute to a specific study.

There is also a dearth of research in relation to public views regarding consent procedures and the use of archived samples from deceased donors. Ring and Lindblad (2003) found that half of their participants (52%) thought it was acceptable to use archived samples from deceased donors provided a research ethics committee approved the study. Similarly, Hoeyer et al (2004) found in their survey of the Swedish public that almost half (48%) of participants considered it acceptable that a research ethics committee decide whether stored samples are used for research "*if I am deceased and my relatives have to be approached*" (p. 226). However, over one third of participants (37%) in Ring and Lindblad's study indicated that relatives should be asked for consent on behalf of the deceased.

1.3.2 Consent Preferences: setting and confidentiality

Examining public preferences for consent procedures solely in terms of general versus specific consent is rather limited as it fails to take into account important contextual factors which may affect public preferences. Such factors include whether the sample is clinically derived or derived from a research study and whether it is stored under a linked or an unlinked/anonymous model. Schwartz et al (2001) found that their participants were significantly more likely to indicate the need for informed consent for clinically derived samples than research derived samples. In relation to linking samples to medical records, the UK's MRC and Wellcome Trust (2001) focus group discussions found that some participants considered it too intrusive and an invasion of privacy while others considered it acceptable. Lindblad et al. (submitted for publication), found that 86% of participants reported a willingness to donate an extra blood sample for research purposes under a linked model. Of those who said no or were undecided, 28% indicated that they would donate an extra blood sample under an unlinked/anonymous model. However these findings must be interpreted with caution as this strong support for a linked sample may be the view of a self-selected sub-set of those approached for the survey, as over half of those approached (51%) failed to respond.

Wendler and Emanuel (2002) addressed both factors in their study of the views of 504 older Americans in relation to the necessity of informed consent for research on stored biological samples. Sixty-six percent of participants reported that they would require consent for research on clinically derived, personally identifiable samples as opposed to 27% for anonymised samples. Similar to Schwartz et al (2001), a smaller percentage of participants considered consent necessary for research derived samples. However, there was a difference depending on whether the sample was anonymous, with 29% requiring consent for samples which retain personal identifiers and only 12% requiring consent if samples are anonymised before the research is conducted. The authors concluded that once consent for research purposes has been given, the majority of participants considered additional consent for further research as unnecessary. Based on this conclusion, Wendler and Emanuel (2002) recommended that once people give their consent for clinically derived samples to be used in research, they may be regarded as equivalent to research derived samples when deciding whether or not to contact participants for specific consent for additional research. Furthermore, the majority of participants indicated a significantly lower preference for specific consent when samples are anonymised. This is similar to the conclusions derived from the Clayton et al (1995) study, i.e. that informed consent is necessary for linkable but not anonymous samples.

The use of medical records for research is not always considered acceptable. For example, Hoeyer et al. (2004) found that while over 70% of participants were in favour of donated tissue samples being used for genetic research, 62% of participants would not be prepared to allow researchers to have access to their medical records without being asked for permission. Willison, Keshavejee, Nair, Goldsmith and Holbrook (2003) found similar results in their examination of Canadian patients' preferred method of consent for use of personal information in electronic medical records. Seventeen participants were interviewed and a further 123 completed a questionnaire. Those interviewed generally expressed a positive view toward research participation but believed that they should be informed of any research that used information from their medical records. Similarly, 74% of those who completed the survey considered consent necessary before their personal information was used for research purposes. Twenty-six per cent were satisfied to be notified passively about the use of their personal information for research purposes with the possibility of opting-out.

Are we to conclude from this that specific consent is considered more desirable when samples are linked to one's medical record? This preference may be due to a belief that use of a person's medical record without consent is too intrusive or an invasion of privacy as indicated by the UK's MRC and Wellcome Trust (2001). However, public understanding regarding the usefulness of linking samples to medical records is unknown. Would providing the public with this information influence their preference for tissue storage under an un-linked model? There is no national evidence regarding Irish public preferences. One of the objectives of this study is to address these questions in an Irish context.

1.4 Public willingness to contribute to research

While the previous section discussed public preferences for informed consent procedures, it tells us little about whether the public would actually be willing to contribute a sample for medical research. This is crucial as the generalisability of and implications from population-based studies depends on the willingness of the public to contribute to such research (Wang, Fridinger, Sheedy and Khoury, 2001). Several studies have demonstrated that public willingness to contribute tissue samples for medical research is generally high. For example, a national Swedish study found that 86% of the public would be willing to donate an extra blood sample for research purposes (Lindblad et al, submitted for publication). Similarly many participants involved in the UK's MRC and Wellcome Trust (2001) focus group study stated that they would be willing to donate samples for research provided the research was ethical. Participants also preferred the idea of samples being used in disease-specific research than general research. However, Goodson and Vernon (2003) found that public willingness to contribute samples for research may vary depending on the type of tissue. They found that the public was most willing to donate tissues of the head and neck (74%) and ovarian and testicular tissue (71%), and least willing to donate tissue of the eye (54%), the brain (58%), the lung (58%) and bone (50%). The authors concluded that in contrast to other studies, a large minority of participants were not willing to donate just any tissue for research purposes. Reasons for this are unknown, however, the authors speculated that it may be due to recent negative publicity surrounding post-mortem organ retention and reports of medical malpractice. Less negative publicity existed during previous studies, or in studies conducted in countries unaffected by the organ retention controversy. This may be reflected in a higher willingness to donate tissue found in such studies. There is no empirical evidence to support this argument to date. The effects of the organ retention controversy on public willingness to allow tissue samples to be used and stored for research is currently unknown. However, the UK Retained Organs Commission (2003) reported, following quantitative interviews with 1800 adults, that only 34% of participants indicated being aware of organ retention compared to awareness levels of 66%, 69% and 77% for post-mortems, organ donation and blood donation, respectively. The affects of the organ retention controversy on the Irish public are currently unknown and are investigated in this study.

Conclusions derived from studies of public perceptions may be limited as they depend on hypothetical decisions which may not translate into "real life". Firstly the results may be subject to social desirability, such that participants do not want to admit that they would not like to donate tissue for research. Furthermore, real patients may make different trade-offs and may be more concerned than the general public to understand the issues (Edwards, Lilford, Thorton and Hewison, 1998). However, research examining patient willingness to contribute a sample to research is consistent with that of the public regarding hypothetical situations. For example, Jack and Womack (2003) reviewed records of nurse-patient interviews between 1998 and 2002, regarding patient refusals to donate tissue surplus to diagnostic needs to the tissue bank at Petersbourough Hospital NHS Trust. They found that 98.8% contributed to the tissue bank. The authors concluded, that when patients have adequate information, donating excess surgical tissue to medical research is not a contentious issue. Malone, Catalano, O'Dwyer and Giantonio (2002) also reviewed the records of the Eastern Cooperative Oncology Group in the US between 1998 and 2002, to determine cancer patient willingness to allow the storage and future use of samples excess to clinical requirements from therapeutic cancer clinical trials. They found that 90% of the 7,000 patients accrued during this time-frame consented to their excess tissue being stored and used for research. Similarly, Start et al (1996) found that the majority of their 384 post-operative patients were willing to allow their excess surgical tissue to be used for medical research. However, patient responses may not be free from social desirability, particularly if the patients' doctors request their consent to allow their tissue to be used and stored for research. Patients may feel obliged to comply with such medical requests almost without regard for personal preferences due to a perceived dependence on the doctor for their well-being. Contrary to this argument, Lindblad et al (submitted for publication) found that less than 1% of the public would be motivated by a fear that their refusal to donate would affect their relationship with healthcare personnel. However, this response was elicited in response to a hypothetical scenario, which may be distinct from a real situation where feelings of pressure to contribute to research when asked by a doctor may be stronger.

The academic debate in this area has witnessed a distinction between basic medical research and genetic research with the latter being considered more contentious. However, research has shown that the public is also generally in support of genetic research and willing to donate tissue for this purpose (Stegmayr and Asplund 2002; McQuillan et al. 2003; Ring and Lindblad, 2003). An American study revealed that 53% of the public was willing to donate blood for genetic research, and 42% were in favour of both blood donation and long-term storage for genetic research (Wang et al. 2001). Another American study of prospective jury members revealed that 60% would donate a tissue sample for genetic research (Merz and Sankar, 1998). Similarly the Schwartz et al (2001) study of Jewish individuals found that the majority of their sample indicated that they would be willing to allow their stored DNA to be used for genetic research. A recent UK project consulted through workshops with members of the English public and various stakeholders such as primary care professionals, scientists, ethicists etc. regarding contributing a sample to the UK Biobank Project. This project aims to create a database of DNA blood samples and lifestyle information which will be linked to ongoing medical records as well as medical histories from 0.5 million individuals aged 45-69. Those who took part in the workshop were asked to complete a questionnaire. Of the 43 participants who completed the questionnaire, 30 reported that they would consider being a volunteer for the UK Biobank (Opinion Leader Research, 2003).

1.4.1 Factors related to willingness to donate tissue for research

Characteristics of those in favour of donation include being older (Malone et al. 2002), highly educated and have a more positive attitude toward medical and genetic research (Lindblad et al, submitted for publication; Wang et al 2001). Lindblad et al found that those who held negative attitudes towards genetic research were over 80% less likely to be in favour of donating an extra blood sample for research. Wang et al (2001) found that participants who were willing to donate blood and allow long-term storage for genetic research, were significantly more likely to believe that genetic research will prevent disease and to believe in genetic determinism. Similarly, Trauth, Musa, Siminoff, Jewell and Ricci (2000) found that having a positive attitude towards the use of humans in medical research was one of the best predictors of willingness to participate in research. Attitudes towards research are generally positive due to the potential to improve diagnosis and treatment of genetic disorders. However, this is balanced against a concern about how information will be protected against inappropriate uses. The UK Human Genetics Commission (2001) found that 88% agreed that genetic developments would bring cures for many diseases. However one third of participants were concerned that research on human genetics is unethical as it is tampering with nature. Participants who reported that their faith or religion had an influence on their decision-making, were significantly more likely to agree that human genetic research is unethical. The concept of cloning is generally negatively perceived. For example, Goodson and Vernon (2003) found that 65% of participants were willing to give consent for their tissue to be used for research into genetic disorders, but only 26% of participants would allow their tissue to be used in research on human cloning. This negative attitude is reflected in the results of a recent Eurobarometer survey presented by Olofsson

(2004), with particular reference to the Irish and Swedish context. While 68% of Europeans (59% of Irish, 83% of Swedish) considered therapeutic cloning as useful for curing disease, only 22% (14% of Irish, 26% of Swedish) agreed with the statement "therapeutic cloning doesn't threaten the natural order". It was also found that public attitudes toward stem cell research were more positive in 2002 than 1999. For example, 28% of the Irish public thought that stem cell research should be encouraged in 1999, compared to 40% in 2002. However a higher percentage (42%) considered it to be risky in 2002 than in 1999 (37%) (Olofsson, 2004). These apparently contradictory findings make it difficult to speculate whether the Irish public would be willing to contribute to stem cell research, as the relative importance of risk compared to acceptability is unknown.

In an attempt to identify and contextualise barriers and facilitators to participation, several studies have asked participants why they would be willing to participate in medical research or donate biological material for research purposes. The most commonly cited motives included the potential benefit to future patients and to the participant and their friends and family in the future (Opinion Leader Research, 2003; Lindblad et al. submitted for publication; Madsen, Holm and Riis 1999; Madsen, Mirza, Holm, Hilsted, Kampmann and Riis 2002; Corbie-Smith et al. 1999). Both Lindblad et al (submitted for publication) and Madsen, Holm and Riis (1999), found that one third of their sample reported being motivated by a sense of duty. Research has also shown that individuals do not reason independent of context and certain personal experiences have been found to influence one's willingness to contribute to medical research. The most obvious is one's experience of illness. Lindblad et al (submitted for publication) found that participants with a positive family history of genetic disorder or among friends were significantly more willing to donate blood for research purposes. Similarly Wang et al (2001) found that a family history of genetic disorder was related to the belief in genetic determinism which was significantly related to willingness to donate and long term storage of blood for genetic research. Trauth et al (2000) also found that willingness to participate in research was significantly related to having a relative or friend who was sick. The MRC and Wellcome Trust (2001) study found that patients and relatives of patients were more positive toward medical research than the public at large. Furthermore those who reported having a disease themselves were found to have a more positive attitude to consent and more accepting of the use of samples in research. These findings correspond with the consistent finding that the public are generally motivated to donate a tissue sample for the potential benefit to themselves, their family and other patients in the future. It is also likely that members of the public who have health problems or who have family members or friends who are ill, identify more readily with the hypothetical scenarios in the various studies.

Prior participation in medical research has also been found to positively influence willingness to participate in such research (Trauth et al 2001). Similarly Lindblad et al (submitted for publication) found that the highest proportion of potential donors (93%) was among those who had donated blood in the past. Trust in researchers and governing authorities has also been found to positively influence public willingness to contribute to medical research (Lindblad et al, submitted for publication; Asai et al 2002; Corbie-Smith, Thomas and St George, 2002). The MRC and Wellcome Trust (2001) concluded that there was a general tendency to trust the medical profession in the UK but signs emerged that this trust was starting to erode. Participants over 40 years of age and those with illnesses or close to others with illnesses expressed a greater degree of trust. Younger participants were more likely to express concern about the motivation and trust-worthiness of researchers. Many references were made in these studies to the organ retention controversy at Alder Hey. Patient and public trust in the research ethics committees has also been found to influence willingness to participate in medical research. Participants in clinical trials have reported that the presence of public research ethics committees had a positive influence on their decision to take part in the study (Madsen, Holm and Riis,1999; Madsen, Holm, Davidsen, Munkholm, Schlichting and Riis, 2000 and Madsen et al 2002). Similarly, Hoeyer et al (2004) found that 67% of the Swedish public would be willing to allow a research ethics committee decide whether to approve the use of their stored tissue in a research study without asking the individuals permission. This highlights significant support for the role of research ethics committees in governing research using human tissue. However, almost 22% indicated that they or their relatives should be consulted. These findings are in contrast to those of the UK Human Genetics Commission (2001) which found that seven out of ten participants, particularly those aged under 25 years, had little or no confidence that the rules and regulations are keeping pace with new research developments.

A related issue to governing authorities is the influence of the funding agency on public willingness to contribute to medical research. The majority of participants (68%) in the Lindblad et al study (submitted for publication) of the Swedish pubic reported that their willingness to donate blood would not be influenced by the financial source of the research and would delegate this judgment to research ethics committees. In contrast, Hoeyer et al (2004) found that over one third of participants reported that corporate interest in a research project is an important issue to consider when assessing research on stored tissue samples. Fourteen percent of participants rated this as the most important, whereas

only 4% reported informed consent as the most important issue to consider. Similarly the Medical Research Council (2001) focus group study found that the public was concerned about the involvement of pharmaceutical and biotechnology companies in medical research. Feelings about the pharmaceutical industry seemed ambivalent as it was criticised for making profits but it was acknowledged as having an important role in improving public health by developing new drugs. However, those who had health problems themselves tended to be less critical of the pharmaceutical industry than others.

It is also possible that one's attitude towards medicines in general may affect one's willingness to allow stored tissue to be used in medical research, as much research is designed to test and develop medicines. According to Horne & Weinman (1999), many people have negative perceptions of modern medicines as they are often considered dangerous due to their chemical or manufactured nature or their 'unnatural' origins. In a survey of 600 UK undergraduates, over one third believed that medicines generally do more harm than good and 45% thought doctors over-prescribe them (Horne & Weinman, 1997, cited in Horne, 2000). Horne (2000) argued that such negative attitudes may influence treatment preferences, pathways to care and adherence to medication. Taking this logic one step further, it is possible that negative attitudes towards medicines may also lead to a reduced willingness to contribute to medical research. This study will examine in an exploratory manner whether such a relationship exists.

1.5 Desire for feedback

The ethical debate regarding informed consent has focused not only on procedural preferences and willingness to donate to research but also, to a lesser extent, on the appropriateness of informing donors of research results. It has been argued that participants who consent to the storage and use of their tissue for research should have the option of whether they want to be informed about general results emerging from studies using their samples (Beskow et al., 2001; Savulescu, 2002). This was supported by members of the Japanese public who reported that communicating outcomes of a study to participants is an essential precondition for access to archived samples and information without specific informed consent of the donors (Asai et al 2002). Similarly the MRC and Wellcome Trust (2001) found that members of the public would be interested in getting feedback on the developments made as a result of research using their tissue samples. Furthermore, participants felt that those who donate tissue for research should be given the option to be informed about any conditions or diseases they may have, as discovered by the research using their sample. This is consistent with other studies which revealed a strong desire for feedback of research results (Merz and Sankar, 1998; Wendler and Emanuel, 2002). For example, 83% of the Swedish public reported a desire for feedback regarding their genetic predisposition to disease (Hoeyer et al, 2004). However, public desire for feedback seems to vary depending on the context, that is whether the reported disease is preventable or treatable. Hoyer et al (2004) found that only 29% of participants would like to receive information regarding their genetic predisposition regardless of context, whereas 55% would like such feedback only if a treatment or preventive intervention was available, and 10% preferred not to know about anything that they had not asked. However, findings of Lindblad et al (submitted for publication) were not consistent with those of Hoeyer, as they found that 47% of participants desired feed-back regarding hereditary disease regardless of context, 24% wanted feed-back if there was a slight chance of preventing or treating the disease and a further 11% only wanted feed-back if there was an established treatment or prevention. Similar to other studies, 8% did not want to be informed at all.

While it would appear that in general the public would like some level of personal feedback, failure to provide such feedback does not appear to affect willingness to donate to medical research. For example, Mc Quillan et al (2003) found that 80% of Americans were willing to allow their blood to be stored in a national repository for genetic research. Participants agreed to this in the knowledge that they would not be contacted with specific results. They were provided with general information regarding studies being conducted using samples from the repository by means of a newsletter. However, there is currently no consensus regarding the appropriateness of providing feedback on an individual basis. The majority of experimental studies are exploratory in nature and the interpretation of data generated from such studies requires a chain of evidence supporting the validity of their findings. Each individual study is simply one component of this chain. Until a chain of evidence has been established, the results of any one study are not clinically valid (Beskow et al 2001). Fuller, Kahn, Barr, Biesecker, Crowley, Garber, Mansoura et al (1999) argued that the absence of clinical validity could result in the transmission of false-positive or false-negative results to participants which could lead to physical, psychosocial or economic harm. The UK Biobank Project under development will avoid such potential harms as it has made clear it will not provide personal genetic information to those who donate to the repository (Opinion Leader Research Consultation, 2003).

1.6 The Irish context

Research and policy innovation concerning human tissue research has, as is outlined here, been primarily international. In Ireland, in the context of an increasingly knowledge-focused society, financial support for health-related research has increased exponentially in the last decade. Large-scale local, national and international studies involving use of human tissue are possible (and some are ongoing) as are increasing discussions about bio-banking and related issues. Ethical review of research has very rapidly become the norm with logistic challenges such as approval for multi-centre studies (e.g. Smith, Doyle, McGee & de la Harpe, 2004), EU legislation (e.g. the 2004 Directive on Clinical Trials) and with national guidelines development being addressed by a number of agencies. In 2002, the Health Research Board (the national research funding agency with the primary brief to fund health research) produced a broad discussion document on ethical and legal issues in relation to genetic research and human biological samples (Sheikh, 2002). The recently established Bioethics Committee of the Royal Irish Academy has consulted, in the context of discussions on bio-banking, with relevant stakeholders to develop guidelines for ethics committee work. They have just completed recommendations on management of human biological material for research (Irish Council of Bioethics, 2005).

While groups such as the Bioethics Committee have provided a valuable forum for the expression of views by 'interested parties', there is little knowledge on the views or preferences of the Irish public (and representative groups of professionals) on these issues. A recent study which provides some information relating to this area is a postal survey of intensive care unit nursing and medical staff assessing aspects of organ donation (Smith and McGee, 2004). This survey of 1,007 staff (68% response rate) found high personal support for organ donation (90%) with staff also outlining various barriers (attitudinal, educational and institutional) to requesting organ donation in ICU settings. The effects of recent 'controversies' on their confidence in asking families for donation was assessed. Forty three percent said the controversy surrounding organ retention had made their organ donation work such as asking families to donate organs of the deceased more difficult. While organ donation and the organ retention issue are not entirely concerned with research *per se*, it is to be expected that these issues become intertwined with research and questions about research practice and quality in the public domain. The dearth of information on Irish views on issues concerning research with human tissue prompted the present study. This information-gathering task can be seen as a first step in a much longer public consultation process about this important societal issue. As such, it is conducted in the wider context of promoting key principles of the Health Strategy *"Quality and Fairness – A Health System for You"* (Department of Health and Children, 2001).

It provides policy-makers, research funders and planners and the research community more generally with an opportunity to gauge public awareness, concerns, preferences and activities in relation to research. Health-related research, including a project such as this, can only be achieved with public support both at the structural/financial level and at the level of individual willingness to contribute to research endeavours. The study is thus timely given rapidly developing technologies and possibilities in the area of research involving human tissue, recent controversies concerning human tissue retention and the need to inform and consult with the Irish public on these issues.

1.7 Aim of the present study

The aim of the present study was to establish nationally representative data regarding public perceptions concerning use of human tissue samples for medical research. Specifically, the research aimed to provide nationally representative data on:

- Public willingness to donate a tissue sample for medical research
- Public preferences for informed consent procedures in relation to the use and storage of human tissue for medical research
- Public preferences for tissue storage (linked or unlinked model of storage?)
- Level of feedback on research findings considered desirable by the public
- Public awareness of, and attitudes towards, the recent organ retention controversy.

The study objectives were:

- to identify and contextualise factors which may promote or impede the public's willingness to donate excess surgical tissue for use and storage for medical research: *demographic factors* (age, gender, education, children, work status, religiosity, health insurance); *health status, medical and healthcare experiences* (health status, use of long-term medication, inherited condition (self/family), hospital inpatient, blood test, tissue test, and post-mortem of family member); *previous contributions to tissue donation and research* (donated blood, research participation, willing to donate organs for transplantation, donor card, family member donated tissue/organs); knowledge and attitudes (awareness of tissue storage, attitude to medical/genetic research and researchers, trust in scientific researchers and governing authorities, motives for participation - sense of duty, benefits of research to health, fear that refusal would affect relationship with health care personnel or affect their health care); *effects of the organ retention controversy*

- *to provide data on public preferences for* use of samples under a linked or an unlinked model and changes observed in preferences for linked or unlinked model following receipt of information regarding the usefulness of the linked model

- to provide data on public preferences for informed consent (preferences for specific or general consent regarding the use of archived samples for medical research, consent preferences for use of a deceased donor's stored tissue)

- to determine what level of feedback is considered desirable by the public, feedback regarding the study results in general or individual feedback regarding personal genetic risk for an inherited disease, and whether individual feedback is desirable if the inherited disease can not be treated or prevented

- to determine public awareness, level of engagement and attitude towards the organ retention controversy and to identify the effects of this controversy on public confidence in the health care system

- to provide data to inform policy and practice regarding the storage and use of human tissue for medical research. It is conducted in the wider context of promoting public participation in health services decision-making; a first step in such consultations is information on public attitudes and experiences.

[1] The enzymatic digestion of cells by enzymes present within them. The cells most susceptible to autolysis tend to be dying or dead cells.

[2] Anonymising samples involves removing identifying information from the sample so that it cannot be linked back to the patient from whom the sample was taken.

[3] Specific patient identifiers are separated from the specimen so that no immediate link can be made with the patient. However, a coding system is in place which allows the patient's specimen to be identified by researchers (Prime, Sobel and Herrington, 2000)

2. METHODOLOGY

2.1 Introduction

The overall aim was to devise a sound methodological approach that would yield scientifically reliable and nationally representative data to inform evidence-based protocols in relation to issues of informed consent and the use and storage of excess surgical human tissue for medical research. This study also sought to identify factors which promote or impede willingness to allow one's excess surgical tissue to be used and stored for medical research. To achieve this a nationally representative survey of the adult population was conducted.

A cross sectional national survey of the adult population (18 years and older), using a telephone interview methodology, was selected as the most appropriate methodology to meet the aims of the study. The study protocol received ethical approval from the Research Ethics Committee of the Royal College of Surgeons in Ireland (RCSI).

2.2 Sample

The sample to be included were those members of the public aged 18 years and older. A stratification control was imposed at the point of interview in the selection of individuals within the selected household to ensure that the socio-demographic structure of the completed survey was in line with that of the national population at large. This control was determined by gender; broad PES (principal economic status) and broad age cohort (based on 2002 Census figures). This ensured the selection of a representative sample of individuals within the randomly selected households. A sample size of 2,000 was targeted, to include equal numbers of men and women. Further information regarding household selection is outlined in section 2.3.2.

2.3 Measures

2.3.1 Interview schedule

Since all of the aims of this particular study were not adequately addressed by any one existing research questionnaire, a specific interview schedule was devised. The interview schedule was informed where relevant by other research questionnaires. Use of questions from relevant international questionnaires was considered to maximise the comparability of the data collected in this study. The interview schedule was primarily informed by the Swedish study by Lindblad et al (submitted for publication). However several additions and amendments were made to ensure questions were valid in an Irish context. As was the experience of Lindblad et al, the development of the questionnaire was difficult given the complexity of the topic. The content validity and feasibility of the questionnaire was ensured through negotiations with various relevant experts (psychologists, medical scientists, physicians, a legal expert and a statistician) to ensure the relevancy and clarity of questions.

The interview schedule was separated into 11 sections based on topic and appropriate ordering of topics in relation to question sequence and specific participant experiences. A summary of each section is provided below.

Section A – *Introduction*

This section provided a standardised introduction to the study, detailing who was conducting the study, its confidential nature and how telephone numbers had been randomly selected. Following agreement to participate and confirmation that the participant was 18 years or older, further information was given regarding the interview and study verification procedures were offered (namely to contact the study co-ordinator at the RCSI or the Economic and Social Research Institute [ESRI]).

Section B – *Beliefs about medicines and medical research*

The first questions in this section gathered information regarding participant beliefs about medicines using the Beliefs about Medicines Questionnaire (BMQ) (Horne, Weinman and Hankins, 1999). The BMQ is split into two sections: beliefs about specific medication prescribed for a particular illness (BMQ-Specific)

and beliefs about medicines in general (BMQ-General). These two sections of the questionnaire can be used in combination or separately (Horne et al. 1999). This study used only the BMQ-General as the sample was that of the general public. The BMQ-General comprises 2 four-item factors assessing general harm and general overuse of medicines. The general harm factor was examined as it was considered most relevant for this study. Items in the original scale included: *People who take medicines should stop their treatment for a while every now and again, Most medicines are addictive, Medicines can do more harm than good*, and *All medicines are poisons*. However, the internal reliability for this original scale was less than satisfactory (alpha=0.54). Horne, Graupner, Frost, Weinman, Wright and Hankins (2004), reported that the internal reliability improved significantly when the item '*natural remedies are safer than medicines*' was transferred from the overuse scale to the harm scale and the item '*all medicines are poisons*' was excluded from the harm scale. The alpha for this revised harm scale increased to 0.62. Therefore the current study adopted this revised 4-item scale. Participants were asked to indicate their level of agreement with each individual statement on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Scores obtained for the individual items were summed to create a scale score. Total scores ranged from 4 to 20, with higher scores indicating stronger beliefs in the 'harm' concept.

This was followed by questions regarding participant attitudes to medical research and medical researchers. The remainder of section B examined public awareness of research-governing authorities [Irish Medicines Board, Health Research Board and research ethics committees (REC)]. A definition of a REC was given to all participants after finding out how much was known about them, as knowledge of their function was important for further follow-on questions. Participants were then asked to indicate how confident they were in the ability of the various governing authorities and personnel [including the Department of Health and Children, Health Boards, researchers at pharmaceutical companies and universities and doctors and nurses] to assess the benefits and risks involved in medical research. This was considered a proxy measure of trust, as to ask about trust directly may have the confounding effect of creating suspicion among participants or result in socially desirable answers (Eurobarometer 58.0, 2003).

This section also examined whether participants had heard of any medical or health related research conducted in Ireland in the last three months and where they heard about this research. Participants were also asked to consider how much research is conducted in Ireland relative to other European countries, ranging from a lot more to a lot less.

Section C – *Medical experiences*

The first part of section C established the participant's health status, use of long-term prescribed medication, and experience as a hospital in-patient. This was followed by questions regarding the participant's belief in genetic determinism, whether they or a family member had a genetic condition or perceived themselves as being susceptible to a particular genetic condition. Information was then gathered on whether the participant had ever had a blood or other medical tests, donated blood/willing to donate blood or participated in medical or health related research. For those who reported previous experience of research participation, they were asked questions regarding the type of research, who asked them to participate, their level of satisfaction with the research and whether their experience would influence their willingness to participate in medical research again.

Section D – *Attitudes to genetic research*

The first questions in this section involved global measurement of participants attitudes to genetic research [i.e. whether genetic developments will bring cures for disease and whether genetic research is tampering with human nature]. Participants were then asked to indicate whether they approved, disapproved, were unsure about or had never heard of various types of specific genetic research, namely, stem cell research using adult human tissue, stem cell research using human embryo tissue, cloning of human cells and development of genetically modified foods.

Section E - Consent *preferences*

The first question in this section established whether the participant was aware that tissue samples may be stored as part of a persons medical record for future care and treatment. This was followed by a hypothetical scenario concerning an operation where a sample of tissue is removed for tests. Participants were asked whether they would allow excess surgical tissue not needed for tests to be used in a research study approved by an ethics committee. Participants who agreed to this were asked whether they would agree to their excess tissue being stored for future research approved by an ethics committee. Participants were then asked to indicate their consent preference for the use of a person's archived

sample. They were given three options, general consent [i.e. a person gives their consent once for an unspecified number an type of study], specific consent [person is asked for consent before each new study using their sample] or thirdly, each individual decides at the outset whether they want to provide specific or general consent. Participants who indicated that the person should decide, were asked for their personal preference for specific or general consent.

All participants were asked whether they thought it acceptable to use stored tissue of a person who allowed their excess surgical tissue to be stored for research but who could not be re-contacted to get permission. They were then asked whether it was acceptable to use stored tissue of a deceased donor who was never asked permission to use their sample for research. Participants who reported that they would be willing to allow their excess tissue to be used for a research study were asked whether they would prefer their sample to be used under a linked model [i.e. possible to link to the patient's medical record] or an unlinked model. Participants who indicated a preference for the unlinked model were then informed that tissue samples are of greater value to research when they are linked. They were then asked again whether they would be willing to have their sample linked to their medical record.

Section F – *Willingness to contribute tissue sample to medical research*

This section gathered information regarding public willingness to allow their excess tissue sample to be used for research funded by the government and a pharmaceutical company.

Participants were then asked whether their decision to allow their excess tissue to be used in medical research would be influenced by a sense of duty for the benefit of future patients, possible benefits to their own health, possible benefits for the health of their family, a concern that refusal would negatively affect their relationship with doctors and nurses or a concern that refusal would negatively affect the healthcare given to them.

Section G – *Desire for feedback*

Participants were asked to consider the hypothetical situation of allowing a blood or tissue sample to be used for research, and whether they would want general information regarding the results of the study overall or whether they would like personal information regarding their own genetic risk for an inherited disease. Participants who indicated yes, unsure or it depends to personal feedback, were then asked whether they would want such information if the disease identified could not be prevented or treated.

Section H – *Attitudes to organ donation*

Participants were asked a number of questions regarding organ donation after death including willingness to donate for transplantation, having ever discussed organ donation with their family, having signed a donor card and whether a deceased family member donated their organs. When a family member had donated organs, participants were asked what their relationship was to them, how many years ago, which organs were donated and their evaluation of how the donation process was managed by the hospital.

Section J – *Attitudes to post-mortems*

This section was introduced with a definition of a post-mortem. Participants were then asked whether an immediate family member had a post-mortem, or whether their family was ever asked for permission to conduct a post-mortem on a deceased family member. Participants who reported the post-mortem of a family member, were asked several questions including their relationship to the deceased, how many years ago the post-mortem was conducted, whether it was a ordered by the coroner or requested by a hospital and their evaluation of how the post-mortem was managed.

Section K – *Organ retention controversy*

The first questions in this section gathered information regarding participant's level of engagement in this controversy. They were asked if they had heard of the cases, had they talked about them with anyone, had they read newspaper articles or listened to the radio reports about the issue. This method of classification is adopted from the Eurobarometer 58.0 (2003) which defined the engaged public as "people who are more aware, knowledgeable and behaviourally involved in the subject" (p. 2). Information was also gathered as to whether those interested in the issue were interested due to a professional, personal (personal involvement or know of a particular case) or a general interest.

The organ retention controversy was explained, so that further responses would be based on the same information. The remaining questions concerned their attitude towards the organ retention controversy and whether they thought families should be financially compensated for the distress caused. Finally participants were asked to indicate whether this controversy had affected their confidence in various health care personnel [including doctors, managers of hospitals, management of Health Boards, the Department of Health and Children and researchers].

Section L – *Personal details*

This section gathered demographic information on age, gender, employment status, health insurance or medical card, experience of working in the health care or pharmaceutical industry, marital status, children, educational level, importance of religious or spiritual beliefs and geographic location.

2.3.2 Telephone interview methodology

The chosen method for data collection was telephone interview. Telephone interviews are valuable as they provide participants with a sense of anonymity once they understand that their number has been chosen at random. A sense of anonymity was considered to be relevant to this study due to the sensitive nature of certain sections of the interview schedule, particularly those relating to death, post-mortems and organ retention. The telephone interview technique has been adopted successfully in studies on similar themes (Trauth et al., 2000; Schwartz et al., 2001; Wendler and Emanuel, 2002). It is also increasingly used in sensitive research studies in Ireland (e.g. sexual abuse (Mc Gee et al 2002) and contraceptive practices (Rundle et al 2004). Additional details on telephone survey methodology are available in McGee et al (2002). Telephone surveys, unlike self-report questionnaires, allow complex issues or questions to be clarified thus ensuring greater understanding of questions posed and yielding more reliable responses.

Telephone calls were conducted using a system called random digit dialing (RDD). This allows the widest coverage of telephone numbers by enabling contact with ex-directory numbers and new numbers currently not listed in phone directories. Only landline numbers were used, as using both landline and mobile numbers would create a double opportunity for some individuals to be contacted, thus confounding results.

Lists of telephone numbers were generated using the RANSAM system of the ESRI, as follows. The area code was selected from among possible Irish codes and possible 'stems' were then identified. The 'hundred bank' method was used where a local telephone number was generated and the last two digits were used to create a full set of 100 numbers ranging from "XXXXX00" to "XXXXX99".

One major challenge of data collection is sampling a representative sample of the population of interest. In relation to telephone surveys a potential limitation is the exclusion of a percentage of the population who do not have landlines. However the most recent rates of landline telephone penetration for the republic of Ireland were just under 90% (Household Budget Survey, 2001). While this means that certain households cannot be contacted (possibly those with younger and more transient occupants or in newer housing), other methods of population sampling such as the electoral register or the postal register of households are less comprehensive than this telephone contact system in Ireland. In conclusion, it was considered that the telephone method was most appropriate for this study as it allowed the widest coverage of the general population and it was viewed as facilitating clear reporting of sensitive issues in an Irish context.

Concern about potential exclusions from the survey due to possible reduced landline coverage within various groups (such as younger people) was balanced in the survey by using a sophisticated re-weighting or statistical adjustment procedure to ensure that the data collected were balanced by population characteristics such as age, gender, marital status, education, region and health care coverage. This statistical adjustment was implemented prior to data analysis. The weight was constructed to adjust the sample distributions to these external population totals using the Gross programme developed by Johanna Gomulka. Thus, the data are fully representative of the population that fall with in the scope of the survey (i.e. 18 years and older). Such re-weighting of survey data is a standard aspect of sample surveying and allows conclusions of a wide generalisability.

The 'conversion call' provides an otherwise unavailable opportunity for those who have declined participation in an unsolicited ('cold call') contact by a researcher to reconsider participation. Conversion calls were made to all those who had refused participation on the first contact call. The reasons for re-contact ("*It provides us and you with the possibility to reconsider your decision to participate*") were provided.

All interviewers were women. Previous research has revealed that response rates and general participant acceptance of sensitive surveys are higher for female interviewers (Tjaden, Thoennes and Allison, 1996; McGee et al., 2002).

2.3.3 Piloting the interview schedule

The interview schedule was piloted on 101 randomly selected members of the public to field-test the questionnaire and identify any problems. The questionnaire was generally well received and well understood by the public. The pilot resulted in rewording some questions and clarification of the consent options in section E.

2.4 Procedures

2.4.1 Telephone interviewer training

A team of interviewers worked on the project. A number of training sessions were organised for interviewers covering the issues of medical research using human tissue, the recent controversies on these issues reported in the media, areas where particular sensitivity was needed and detailed instructions on conducting the interviews. Interviewers were instructed on their role and responsibilities, which included ensuring their own safety (this was done according to written protocols developed by the team as part of previous surveys on sexual abuse and contraception). They were also provided with a list of study-related definitions for clarity (see Appendix 1). Ongoing supervision of the survey calls was provided by the management team.

2.4.2 Telephone interview procedure

Telephone interviews were conducted by an experienced telephone interview team from the Economic and Social Research Institute (ESRI). Telephone calls took place in a designated call centre at the ESRI (internal) or in the interviewers' own home (external). A fieldwork manager monitored response rates at the level of the individual interviewer. Telephone interviewers received ongoing support from the core research team throughout the interview phase. This core team has extensive experience with national sampling, population surveys, interviewing on sensitive issues and telephone surveys**.**

When making calls, numbers were allowed to ring ten times. Messages were never left on an answering machine to avoid confusion. Repeated call backs were made, with each number being called up to ten times. If, after the tenth attempt, there was still no answer, the telephone number was recorded as 'no answer'. In order to contact participants who are unavailable during normal working hours, evening (up to 9pm) and Saturday (10.00-3.00pm) calls were scheduled.

2.4.3 Confidentiality and study verification procedures

Participant identity and their address was unknown to the research team as their telephone number was selected at random. The procedure for generating telephone numbers was briefly explained to potential participants at the start of the telephone call. Telephone numbers were not recorded on the questionnaire.

Clear study verification procedures were necessary to allow participants verify the authenticity of the request to participate in the study. Two methods of study verification were offered to participants in the introduction section of the interview schedule. The options were to phone the project co-ordinator at the Psychology Department in the RCSI or to phone the ESRI switch-board and ask to speak to the medical research survey team. Both telephone numbers were given to participants. A small number of queries were received over the course of the survey. They almost exclusively focused on validation of the telephone call and its purpose.

2.4.4 Participant support

Interviewers monitored distress and used a range of strategies throughout the interview process to manage distress. Telephone interviewers could direct participants to information sources (e.g. the State-provided organ retention telephone helpline) or, where participants showed distress, interviewers followed a specific written protocol devised for such studies (see McGee et al, 2002).

2.4.5 Data entry and analysis

Quantitative analysis of the data was performed using the SPSS statistical programme. This provided basic descriptive statistics and more complex statistical analysis to address research questions. Descriptive analyses are presented in the form of frequencies. Univariate analysis was conducted using binary logistic regression. Mulitivariate logistic regression was then used to explore the relationship between various predictor variables (significant at a univariate level) and the outcome variables of interest (namely willingness to allow use of excess surgical tissue and consent preferences).

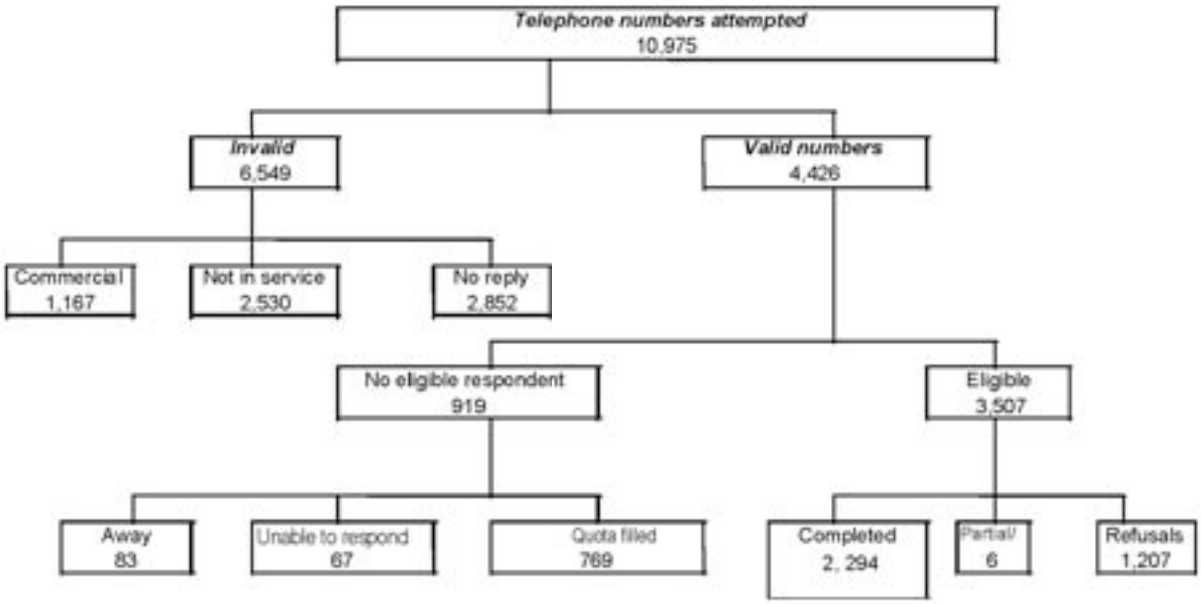
3. RESULTS

3.1 Response rates

- 2,294 interviews were completed (967 men and 1,327 women).
- The overall response rate, i.e. completed interviews, was 65%.

In total, 10,975 unique telephone numbers were called in the study. Figure 3.1 summarises the outcome for each call and the response rates for the final dataset. In total, there were 2,294 interviews (967 men and 1,327 women) giving an overall participation rate of completed interviews from the 3,507 eligible participants of 65%. This is a very satisfactory response rate considering the sensitive and potentially emotive nature of the topic. This response rate was achieved using multiple strategies to facilitate participation, including the conversion call procedure. The value of the conversion call was illustrated as 253 of first time refusals opted to participate on a second invitation, thus increasing the response rate from 58% to 65%.

Figure 3.1 Profile of unique telephone numbers called and outcome classifications for survey



Response rates may vary considerably according to the type of methodology employed and the subject matter under examination. Several international surveys relating to issues of informed consent and the use and storage of tissue (from living sources) for research have been undertaken (table 3.1). Response rates have tended to be higher in studies that recruited individuals directly from a healthcare setting or that involved patients. For example, Goodson et al. (2004) found that 100% of participants approached in a dental practice in the UK agreed to complete a questionnaire regarding their attitudes towards tissue donation for research. Similarly Start et al. (1996) achieved a 91% response rate when asking post-operative patients in the UK to complete a questionnaire regarding ownership and use of human tissue. Stegmayr & Asplund (2002) achieved a response rate of 95% when re-contacting Swedish participants who donated a blood sample in the 1990 cardiovascular risk factor survey in the World Health Organisation (WHO's) MONICA project. High response rates were also achieved in two American studies which were part of a larger ongoing national study concerning public attitudes and health behaviours (Wang et al. 2001; Mc Quillan et al. 2003).

Table 3.1 Sample of response rates from surveys regarding attitudes towards informed consent and use and storage of human tissue for research

Study	Year	Response Rate %	Interview Methodology	Sample Size (n)
Public setting				
Current study	*2005*	*65*	*Telephone*	*2,294*
Schwartz et al	2001	20	Postal survey	273
Lindblad et al	2005	49	Postal survey	2,928
Hoyer et al	2004	60	Postal survey	589
Ring & Lindblad	2003	30	Postal survey	154
Clinical setting				
Goodson & Vernon	2004	100	Survey- introduced by researcher	100
Start et al	1996	91	Survey- introduced by researcher	384
Research setting				
Stegmayr & Asplund	2002	95	Postal survey	1,342
Wang et al	2001	84	Survey - introduced by researcher	2, 621
Mc Quillan et al	2003	72/80	Face-to-face interview	1,974/2,933

Lower response rates are reported when participants are sampled from the public arena rather than a clinical or research setting. For example, Schwartz et al. (2001) achieved a response rate of 20%, when inviting Jewish individuals in the US to participate in a survey regarding their attitude towards the necessity of informed consent for the use of stored DNA for genetic research. The Swedish research group achieved a response rate of 30% in their preliminary study of public perceptions of biobanks and informed consent (Ring and Lindblad, 2003). This increased to 49% in their larger study which involved sending up to three reminders to non-participants (Lindblad et al. submitted for publication). Another Swedish study yielded a response rate of 60% in their study of public attitudes to the use of tissue for research. This response rate was achieved following the distribution of one questionnaire and three reminders (Hoyer et al. 2004). Comparing international consent rates for public surveys, the response rate of the current Irish study was the highest of which we are aware and at 65% was very satisfactory. The cold call telephone approach as used in this Irish study may in fact be more useful than questionnaires for this type of study in contemporary settings.

3.2 Demographic profile

3.2.1 Demographic profile

- The sample was statistically re-weighted to match the structure of the Irish population. The results can thus be considered representative of the general population.

- The study sample comprised 42% men and 58% women.

The demographic profile of the survey data is displayed in table 3.2, with general population comparison data taken from the Census of Population 2002 and the Quarterly National Household Survey (both undertaken by the Central Statistics Office (2004) (CSO)). As is standard with population survey data, the information collected from the questionnaire was statistically adjusted or "re-weighted" prior to analysis[1].

Table 3.2 Demographic comparison of study sample with general population* by gender

	Men %			Women %		
Demographic Characteristics	**Un-weighted Sample N=897**	**Weighted Sample**	**General Population**	**Un-weighted Sample n=1,144**	**Weighted Sample**	**General Population**
Gender	42	49	50	58	51	50
Age						
18-34	9	18	19	12	18	19
35-44	10	10	10	13	10	10
45-64	15	15	15	25	15	15
65+	8	6	6	8	8	8
Marital Status						
Single	14	22	21	13	18	17
Married	25	25	25	37	26	25
Divorced/separated	1	1	1	2	5	2
Widowed	2	1	1	6	2	5
Current Employment Status						
At work	30	34	34	28	24	24
Unemployed	1	3	3	1	1	1
Student	2	3	3	2	4	4
Retired	8	7	7	8	2	2
Home duties/Other	1	2	2	19	20	19

** Central Statistics Office (2004)*

The purpose of this re-weighting procedure is to ensure that the structure of the complete sample is in line with the known structure of the population, according to the classificatory variables used in the analysis. Statistically adjusting data prior to analysis is standard practice in population surveys and addresses any potential bias which may arise from issues related to differential non-response within subgroups of the population.

The variables used in the statistical adjustment or re-weighting procedure were number of adults in the household, gender, age cohort, marital status, level of educational attainment, current employment status, region and healthcare coverage (GMS (i.e. public/State provided) or private health insurance). The interaction of these variables was also incorporated into the re-weighting scheme. The satisfactory response rate and subsequent re-weighting meant that results can be considered as broadly representative of the general population.

3.2.2 Educational status

Education and socioeconomic status are highly correlated in population surveys. In this study, due to time challenges in conducting 'cold call' telephone interviews, it was not possible to record an individual's occupational grading to the extent necessary to provide a definitive classification of socioeconomic status. Instead education status was used as a broad individual classification variable in this study (table 3.3). The sample was divided into those who had 'primary education', 'lower secondary education' (meaning they had not completed the Irish Leaving Certificate/equivalent), 'higher secondary education' (meaning they had completed the Irish Leaving Certificate/equivalent and additional courses but not to degree level), and 'third level education' (meaning they had completed the Irish Leaving Certificate/equivalent and third level education to at least degree level).

Table 3.3 Educational level of study sample by gender

	Men n= 959 %	**Women n= 1,317 %**	**Total n= 2,276 %**
Primary	23	25	24
Lower secondary	27	16	22
Higher secondary	36	47	41
Third level	14	12	13

Table 3.3 demonstrates the educational level of the total sample. The majority of participants (63%) had completed some or all of secondary school. Women (47%) were more likely to have completed second level than men (36%), and were less likely (16%) to report lower secondary education compared to men (27%).

Participants with primary education were more likely to report having a medical (GMS) card[2] (53%) than more educated groups. For example, 26% and 21% of participants with lower secondary and higher secondary education respectively reported having a medical card in comparison with 18% of those with third level education.

3.2.3 Religious beliefs

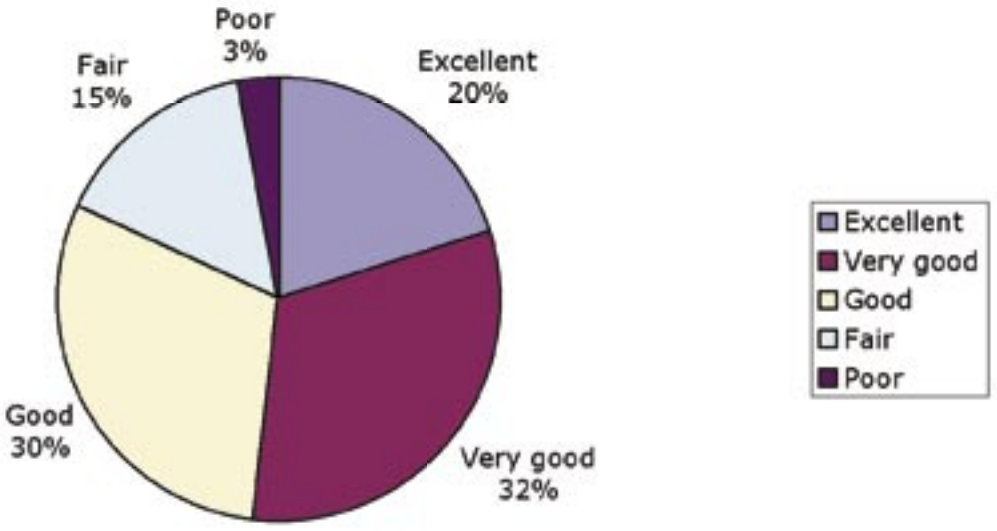
The majority of participants (70%) reported that religious or spiritual beliefs were quite or very important to them. Religious and/or spiritual beliefs were queried because of their potential influence on choices in relation to human tissue research.

3.3 Health status, personal illness and healthcare experiences

3.3.1 Health status

Participants were asked to rate their health status on a five-point scale ranging from excellent to poor (figure 3.2). The majority considered their health to be good or very good (62%), while 18% considered their health to be fair or poor.

Figure 3.2 Profile of self-rated health (n=2,292)



Positive ratings of health decreased with age. For example, 29% of participants aged less than 34 years reported their health as excellent compared to 23% of those between 35-44 year olds, 13% of 45-64 year olds and 8% of 65+ year olds. Almost 30% of 65+ year olds rated their health as fair, compared to 7% and 11% of those aged less than 34 years and 35-44 respectively.

3.3.2 Illness experiences

Participants were asked about their use of long-term prescribed medication and whether they or a family member had a genetic or inherited condition.

Thirty-three percent reported taking long-term prescribed medication at the time of the interview. The most commonly cited reasons for use of long-term prescribed medication were cardiovascular conditions (45%), respiratory conditions including asthma (14%), musculo-skeletal conditions (12%), mental health (10%), thyroid problems (7%) and diabetes (6%). Twenty-one percent of participants reported taking medication for other purposes.

In relation to genetic or inherited conditions, 18% reported having a genetic or inherited condition themselves, with 23% reporting that a family member had a genetic or inherited condition. These figures represent a gross over-estimation of the actual incidence of genetic or inherited diseases in Ireland. It is thus most likely that participants erroneously identified 'familial' conditions such as heart disease or diabetes as being genetic. This confusion of terminology is not a one-sided deficit on the part of participants. Rather it highlights the challenges of ensuring that researchers, health professionals and the public are using terminology in scientific areas in a similar manner. However, in this study participants who reported having a genetic/inherited condition did not report a higher belief in genetic determinism, that is they were not any more likely to consider 'genetic makeup' as the cause for disease compared to lifestyle or a combination of genetics and lifestyle (OR 1.5, 95% CI 0.97-2.2, p=0.07). In contrast, those reporting that a family member had a genetic condition, were significantly more likely to consider genetics as the primary cause of most diseases (OR 1.6, 95% CI 1.14-2.38, p=0.008).

Of those reporting that a family member had a genetic or inherited condition, 48% indicated that they had already developed this condition themselves. The remaining participants, i.e. those who said they had not developed the same condition as a family member were asked to indicate their perceived susceptibility of developing this condition. Almost a quarter of participants (23%) considered it likely that they would develop this condition. A further 19% reported it unlikely that they would develop this condition and 10% were unsure.

3.3.3 Healthcare experiences - blood and tissue testing and hospital in-patient stay

The majority of participants (89%) reported having had a blood test at some point in their life. Women were significantly more likely to report having a blood test than men (OR 3.5, 95% CI 2.60-4.65, p< 0.001). However, less than half of the participants (46%) reported having had a tissue test other than a blood test. Consistent with blood tests, women were significantly more likely to report having had a tissue test than men (OR 5.2, 95% CI 4.34-6.21, p< 0.001) (table 3.4). The likelihood of having had a blood test also increased with age (OR 1.1, CI 1.06-1.08, p < 0.001) such that older participants were more likely to report having had a blood test than younger ones. Similarly, younger participants were significantly less likely to report having had tissue tests than older ones (OR 1.0, 95% CI 1.01-1.02, p < 0.001) (table 3.4).

Participants were also asked about their experience as a hospital in-patient. The majority (82%) reported being a hospital in-patient at some point in their life. Women (88%) were significantly more likely to report being a hospital in-patient than men (76%) (OR 2.2, 95% CI 1.78-2.78, p < 0.001). Similarly, the likelihood of being a hospital in-patient increased with age (OR 1.1, 95% CI 1.04-1.05, p < 0.001) (table 3.4).

Table 3.4 Lifetime experience of blood and tissue tests and hospital in-patient stay

		Blood test (n= 2,281) %	Tissue test (n=2,288) %	Hospital in-patient stay		
				Overall in-patient stay (n=2,280) %	In-patient only once (n=2,280) %	In-patient more than once (n=2,280) %
Gender	Men	83	26	76	31	46
	Women	94	65	88	17	71
	Total	89	46	82	24	58
Age	<34 Years	79	34	69	30	39
	35-44 Years	90	54	87	25	62
	45-64 Years	95	54	89	20	69
	65+ Years	99	50	95	15	80

Of those participants who reported ever being a hospital in-patient, the majority (58%) reported being a hospital in-patient more than once (table 3.4). Interesting gender differences emerged, such that women were significantly more likely to report being an in-patient more than once than men (OR 2.9, 95% CI 2.37 – 3.58, p < 0.001). Similarly, the likelihood of multiple hospital in-patient experiences increased with age (OR 1.0, 95% CI 1.03-1.04, p < 0.001) (table 3.4).

The majority of participants reported that they were satisfied with the care they received in hospital. Of those participants who reported being an in-patient once, 89% were satisfied with care (54% were very satisfied and 35% quite satisfied). Similarly, 90% of participants who experienced being an in-patient more than once reported high levels of satisfaction with the care received (61% were very satisfied and 29% quite satisfied).

3.4 Experience of post-mortem of a family member

Over a quarter of participants (29%) reported that a post-mortem had been carried out on a family member. The family member concerned was often an immediate family member (59%): parent (33%), sibling (13%), child (8%) and spouse (6%). Other more extended family members constituted the remainder (41%) of cases.

Participants were asked to indicate whether the post-mortem was ordered by the coroner or requested by the hospital. Forty-three percent reported that the hospital requested the post-mortem, 29% reported that the coroner ordered it, 6% indicated that their family requested the post-mortem and a further 21% were unsure. These findings do not accurately reflect the actual ratio of hospital requested to coroner ordered post-mortems as the majority of post-mortems are carried out as part of the legal process to establish the cause of death under the auspices of the coroner (c.f. Report of Chief Medical Officer, 2001). It is likely that such discrepancies emerged as the majority of coroner ordered post-mortems are actually carried out in a hospital as opposed to the State morgue. Consequently, many participants may have erroneously considered the post-mortem to have been at the request of the hospital when in fact it was legally ordered by the coroner. These findings highlight a level of confusion regarding the differences between a hospital requested and a coroner ordered post-mortem, among those who have been involved in the process.

Satisfaction with the management of the post-mortem was assessed separately for hospital requested and coroner ordered post-mortems (table 3.5). However, caution is advised in the interpretation of these findings, as outlined above many reported hospital post-mortems may have been coroner ordered post-mortems. Those who indicated that a hospital had requested the post-mortem were asked if they were satisfied with the sensitivity with which the family was asked for permission[3]. Only those participants who indicated that they were personally involved in making the decision to allow or refuse the post-mortem were asked (n=117). The majority of participants described the sensitivity of the request for consent as good or very good (77%) with 16% considering it to be poor or very poor (table 3.5).

Table 3.5 Satisfaction with the management of hospital requested and coroner ordered post-mortems

	Very good %	Good %	Poor %	Very poor %	Don't know %
Sensitivity of the person asking for family consent					
Hospital post-mortem (n=117)	35	42	9	7	7
Explanation given to family about what a post-mortem involves					
Hospital post-mortem (n=117)	22	42	14	10	12
Coroner post-mortem (n=183)	19	25	12	12	32
Provision of post-mortem findings					
Hospital post-mortem (n=99)	13	47	17	7	16
Coroner post-mortem (n=182)	19	27	16	9	29

Participants who were personally involved in post-mortems were asked two further questions (participants who reported permitting a hospital to conduct the post-mortem and those who requested the post-mortem answered these two items). Participants who reported a coroner ordered the post-mortem also answered these questions. Firstly, they were asked to indicate satisfaction with the explanation given to their family about what a post-mortem involves. Of those involved in the decision to allow a hospital post-mortem, 64% indicated that the explanation given was good or very good. In contrast, 24% considered the explanation given as poor or very poor. Satisfaction with the explanation given in relation to a coroner's post-mortem was lower with 44% considering the explanation to be good or very good. Less than one quarter reported the explanation given as poor or very poor and almost one third of participants indicated that they did not know (table 3.5). These findings are consistent with a qualitative study conducted in the Netherlands (Oppewal & Meyboom-de Jong, 2001). They interviewed 12 people who experienced the post-mortem of a deceased family member. Similar to this study, participants reported that too little attention was paid to explaining exactly what was involved in a post-mortem.

Participants then reported satisfaction with how post-mortem findings were provided. Hospital requested post-mortems were viewed more favourably: 60% considered it to be good or very good. In contrast 46% of those involved in a coroner ordered post-mortem reported it as good or very good. Similar numbers held negative views regarding feedback for both types of post-mortems (table 3.5). Again almost one third reporting on a coroner's post-mortem indicated that they did not know. Comparative evidence from other studies is scarce. Most available research considers perinatal deaths. Acknowledging the different patient focus (this study covered all types of post-mortems), satisfaction with feedback from hospital requested post-mortems was lower in this study than a recent UK study of women who agreed to the post-mortem of their baby whom they lost during pregnancy or infancy. Of the 120 women surveyed, 86% felt that findings were explained appropriately and 94% felt they were given sufficient time to ask questions (Rankin, Wright & Lind, 2002). However, satisfaction levels in the present study were greater than those found in another UK study (n=29), where only half of those who consented to a post-mortem after perinatal death were satisfied with the presentation of the findings (Rahman & Khong, 1995). It is notable that despite such dissatisfaction, only 1 in 18 in this perinatal study indicated that they regretted the decision to agree to the post-mortem.

Any request for a post-mortem is necessarily conducted at a time of grief and distress. However, the level of uncertainty is likely to be greater in the case of a coroner ordered post-mortem as it is ordered when there is a sudden or unexpected death such as death of a child after surgery or when an adult dies within twenty four hours of admission to hospital. It is possible that lower satisfaction levels in the case of coroner ordered post-mortems may be influenced by this context. Furthermore, unlike hospital requested post-mortems, families of a deceased who undergoes a coroner ordered post-mortem, may not have contact with the hospital at all. Such families do not receive the support of the hospital bereavement coordinator (hospital official who supports the family during this process) and any communication of information is via the gardai. This lack of support may influence participant views of the management of coroner ordered post-mortems. This may also account for the relatively large number reporting 'don't know' how satisfactory the management of the post-mortem was as they were not fully engaged in the process. Whatever the reason for differences in satisfaction between the two types, the high 'don't know' rate for coroner ordered post-mortems requires clarification and management.

As this study was cross-sectional, it was not possible to determine whether satisfaction levels with the management of post-mortems have changed over time, e.g. whether recent controversies have undermined confidence in the post-mortem process or conversely whether management practices have become more sensitive over time. However, it was possible to examine whether satisfaction levels varied according to the number of years since the post-mortem was conducted. In relation to coroner ordered post-mortems, there were no significant differences in satisfaction levels when taking years since post-mortem into account. In contrast, satisfaction levels regarding explanations were found to be higher among those participants reporting a hospital requested post-mortem in the more recent past (OR 1.06, 95% CI 1.008-1.112, p=0.02). For example, 75% of those reporting on a post-mortem conducted in the last 5 years considered the explanation they received as good/very good compared to 63% of those reporting on a post-mortem in the last 6-10 years, 62% in the last 10-25 years and 39% in the last 26+ years. Similarly, satisfaction levels with the provision of post-mortem findings were highest amongst those reporting on a hospital post-mortem conducted in more recent years (OR 1.08, 95% CI 1.02-1.15, p=0.008). For example, 82% of those reporting on a hospital requested post-mortem in the last 5 years were satisfied with the provision of information compared to 54% of those reporting on a post-mortem conducted in the last 6-10 years, 50% in the last 10-25 years and 36% in the last 26+ years. Higher levels of satisfaction for post-mortems conducted in more recent years, may be due to the introduction of a bereavement coordinator within the last two years.

These findings suggest that satisfaction with post-mortems have not been significantly negatively influenced by the recent organ retention controversy in the last five years. Furthermore, the majority of participants (68%) who reported that a post-mortem had never been conducted on a deceased family member, indicated that they would consent to a hospital request to conduct a post-mortem on a family member. Nine percent indicated that they would not agree and 23% were unsure. This indicates a relatively high level of public support for post-mortems. However, willingness to allow the use of organs or tissue of a deceased family member for medical research was lower than consent to conduct a post-mortem, with just over half (51%) supporting the use of such tissue. Twenty-two percent stated that they would not agree and a further 27% were unsure what they would do if asked.

3.5 Knowledge of medical research and contributions to tissue donation and medical research

3.5.1 Knowledge of medical and health-related research

The majority (74%) reported that they had not heard of any medical or health-related research conducted in Ireland in the last three months. Of those who were aware of such research, the most common sources of information were newspapers (61%), television (44%), radio (36%) and to a lesser extent from other people (13%) and the internet (4%). Participants who reported work experience in the healthcare sector (n=337) were significantly more likely to report being aware of such research compared to those with no such work experience (42 vs 24%) (OR 2.3, 95% CI 1.71-2.96, $p < 0.001$). When participants were asked to consider the level of medical research conducted in Ireland relative to other European countries, 42% believed that less research is conducted in Ireland, a further 18% considered the level to be the same and 13% believed more research is conducted in Ireland. Remaining participants indicated that they were unsure.

3.5.2 Blood and organ donation

The majority of participants had not donated blood, with 34% reporting previous personal donation. A further 2% indicated that they tried to donate but it was not accepted on health grounds. There were no significant gender differences (OR 0.91, 95% CI 0.77-1.08, p=0.27). However, the likelihood of being a blood donor increased with age (OR 1.0, 95% CI 1.01-1.02, $p < 0.001$) and education level (OR 1.2, 95% CI 1.12-1.33, $p < 0.001$). Almost half of participants with third level education (47%) reported donating blood compared to 35% of those with complete secondary, 40% of those with lower secondary education and 28% of those with primary education.

Of those participants who had never donated blood (n=1,311), almost half (45%) indicated that they would be willing to donate in the future. One quarter reported that they would be willing but that they could not donate for medical reasons. A further 21% indicated that they would prefer not to donate blood.

Participant experiences of and attitudes towards organ donation were also measured.
Six percent of participants reported that organs of a deceased family member had been donated for transplantation. The most frequently reported organs donated were: kidneys (42%), eyes (32%), liver (26%) and heart (19%). Participants were also asked to indicate their evaluation of how well the organ donation process was managed by the hospital. Sixty-one percent considered the management to be good or very good with 2% considering it to be poor or very poor. However, 37% reported that they did not know how well the process was managed.

Table 3.6 Willingness to donate organs for transplantation for this sample (compared with a national sample of Irish doctors and nurses working in Intensive Care Units)

	Willingness to donate organs (n=1,943) %	Signed donor card (n=1,199) %	Discussed organ donation with family (n=1,203) %
Total (this study)	73	44	49
Total (ICU doctors & nurses: Irish study – 2004)(N=1,007)	90	54	70

The majority of participants (73%) reported that they would be willing to donate their organs after death for transplantation, 12% were unwilling and a further 15% were unsure. This is consistent with previous international surveys of public willingness to donate their organs (English & Sommerville, 2003; Gross, Martinoli, Spagnoli, Badia & Malacrida 2001; Guadagnoli, Christiansen, DeJong et al. 1999). Of the 73% willing to donate their organs, just fewer than 50% had discussed this wish with their family and 44% reported that they have already signed an organ donor card (table 3.6). The decision to donate

organs is often ultimately made by family members yet half of those who wish to donate have not made their wishes known to their family. Guadagnoli et al. (1999), in their study of 4,365 participants, also found that just over half who are willing to donate failed to discuss their wishes with a family member. Similarly, a recent Irish study of Intensive Care Unit doctors and nurses found that, although the majority supported organ donation, only two-thirds discussed wishes regarding personal donation with their own family and only half had signed a donor card (Smith and McGee, 2004).

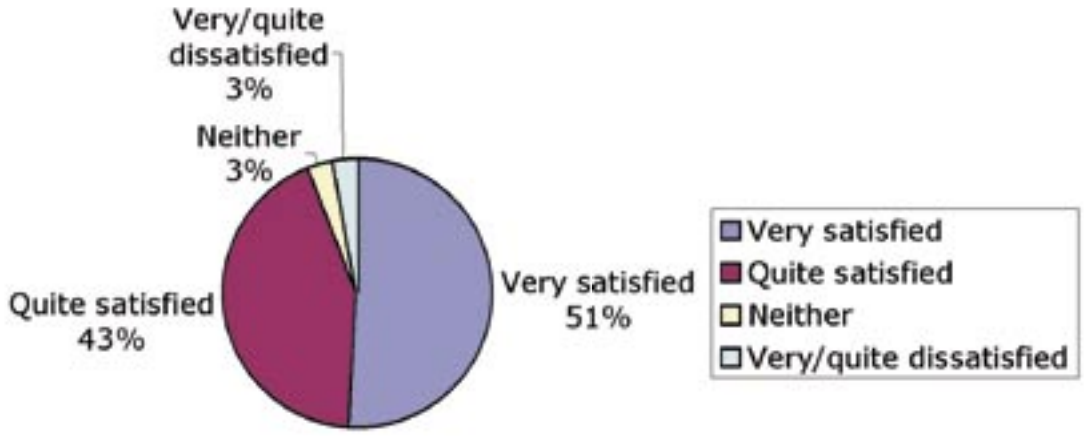
There were no significant gender differences in relation to willingness to donate organs after death. However, willingness was significantly related to age such that younger participants were significantly more likely to report a willingness to donate their organs after their death (OR 0.97, 95% CI 0.96 – 0.98, $p < 0.001$). Over 90% of participants aged less than 34 years were willing to donate their organs, compared to 87% of 35-44 and 45-64 year olds and 67% of adults aged 65 and over. It is possible that older participants perceive that their organs will be of less value than do younger participants or indeed it is possible that older people are more reluctant to donate. Further information is needed to understand this finding. Participants who reported that a deceased family member had donated organs were also significantly more likely to report a willingness to donate their own organs (OR 4.5, 95% CI 1.83 – 11.26, $p = 0.001$). Willingness to donate organs was also significantly related to education level (OR 1.7, 95% CI 1.44 – 1.88, $p < 0.001$), such that those with higher levels of education were more willing to donate. Almost three quarters of those with primary education were willing to donate (74%) compared to 86% of those with incomplete secondary level, 89% of those with complete secondary and 93% of those with third level education.

Willingness to donate organs was not related to in-patient hospital experience (85% of those with hospital in-patient experience were willing compared with 88% of those with no prior in-patient experience). Similarly, those with personal or family history of a genetic condition were no more likely to report willingness to donate organs.

3.5.3 Research participation

Seven percent of participants reported being ever asked to take part in a medical or health-related research study before this present survey. Of those asked, 81% took part. The vast majority (91%) indicated that their participation was unpaid. Research participation generally involved filling in a questionnaire (36%); taking medication (31%); being interviewed (29%); or providing a blood or a tissue sample (29%). Two percent of the overall population reported ever participating in a study which involved consenting to the use of blood or tissue samples which were surplus to clinical requirements. Almost half of the participants who took part in a research study were asked by a doctor taking care of them at the time (46%). The remaining participants were asked by a researcher (23%), a doctor not directly involved in their healthcare (12%) or other (17%). The majority of participants (94%) were satisfied with the way the research was conducted (figure 3.3).

Figure 3.3 Satisfaction with how previous research was conducted (n=147)



Consistent with this high level of satisfaction, 52% reported that their participation would make them more likely to take part in medical research again. Only 11% of these participants felt that their experience would reduce the likelihood of future participation while a further 37% reported that past experience would not influence future decisions regarding research participation.

3.6 Awareness of stored tissue samples and attitudes to medical and genetic research

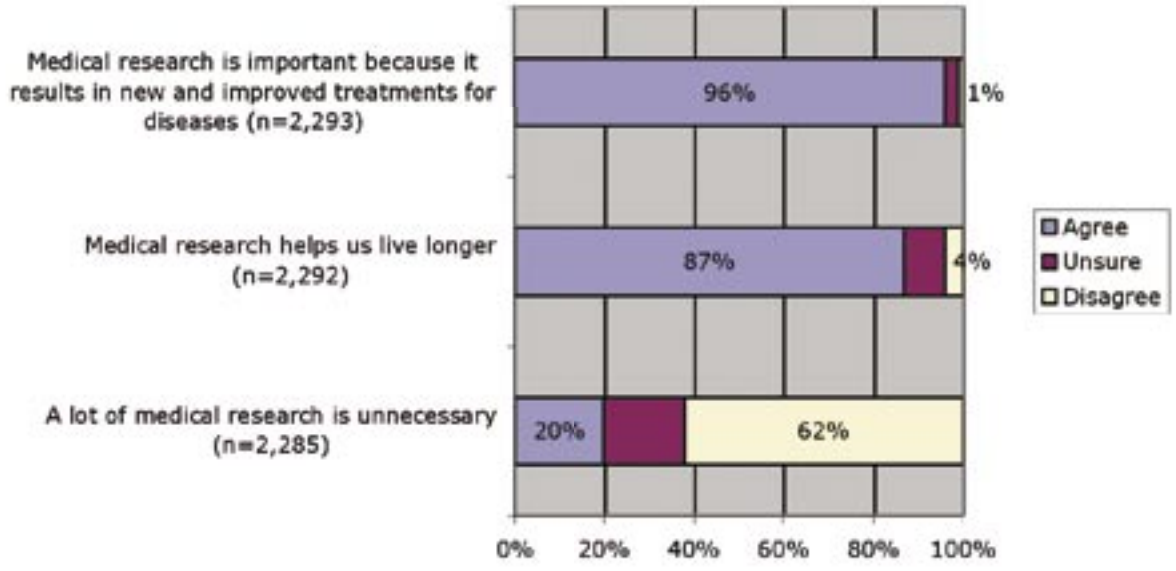
3.6.1 Awareness of storage of tissue samples

Almost three quarters of participants (74%) were unaware that blood or tissue samples are often stored as part of a person's medical record for their future care or treatment. Participants who reported having had a blood test in the past were not any more likely to be aware of tissue storage (OR 0.90, 95% CI 0.67-1.20, p=0.46). In contrast, the relationship between experience of a tissue test and awareness of tissue storage was significant with 28% of those who had a tissue test reporting that they were aware of tissue storage compared to 24% of those who never had a tissue test (OR 1.2, 95% CI 1.01-1.48, p=0.04). Similarly, age was found to be significant with younger participants being more likely to be aware of tissue storage (OR 0.99, 95%CI 0.98-1.0, p=0.01). Significant differences also existed across educational level, such that participants with higher educational levels were significantly more likely to report being aware of tissue storage (OR 1.3, 95% CI 1.16-140, p<0.001).

3.6.2 Attitudes to medical and genetic research

Participant attitudes towards medical research were evaluated using a set of statements concerning the potential benefits and necessity of medical research (figure 3.4). Almost all agreed with the statement that '*medical research is important because it results in new and improved treatments for diseases*' (96%). Similarly, 87% endorsed the view that '*medical research helps us live longer*'. Consistent with these positive attitudes, over 60% disagreed with the statement '*a lot of medical research is unnecessary*' (figure 3.4). However, 20% agreed with this statement and a further 18% were unsure.

Figure 3.4 Public attitudes to medical research

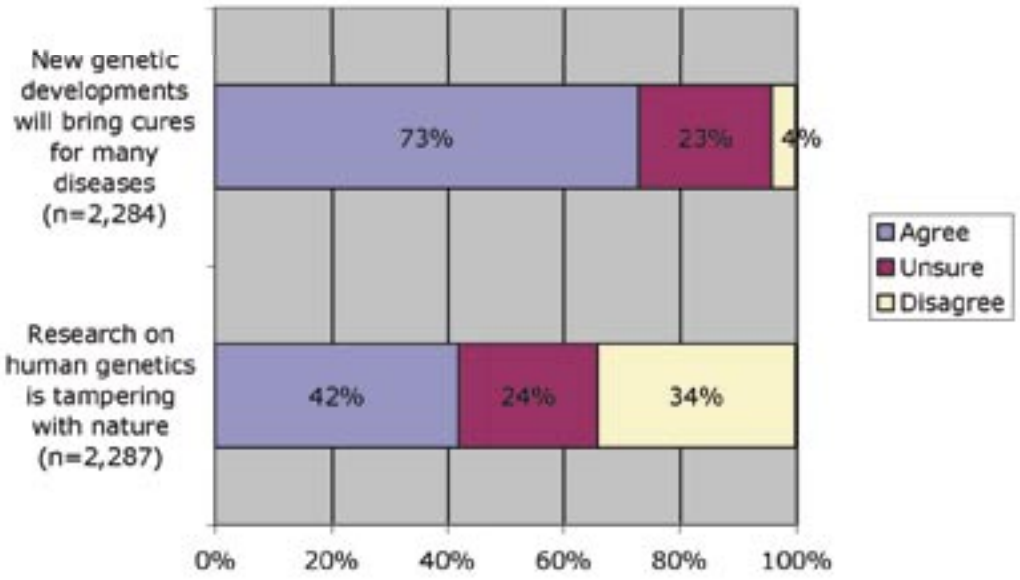


Attitudes to genetic research were evaluated using a set of statements concerning the potential benefits and ethics of genetic research. This was followed by more specific statements regarding specific types of genetic research such as stem cell research and cloning.

Consistent with the generally positive attitudes to medical research, over 70% agreed that '*new genetic developments will result in cures for many diseases'* (figure 3.5). This finding is similar to that of a recent UK Human Genetics Commission (HGC) (2001) report of attitudes to human genetic information, where 88% agreed with this statement. In relation to the ethical question '*Is research on human genetics tampering with nature?*', results indicated some concern among the Irish public.

A significant proportion (42%) felt that it was tampering with nature. However, one third disagreed and a further 24% were unsure (figure 3.5). In contrast, one third of participants in the UK HGC report agreed with this statement. It would appear that the Irish public holds slightly more negative attitudes towards genetic research than their UK counterparts. In other settings, Gross et al (2003) found in their study of young European adults that 60% feared that scientific development in the field of genetics could become dangerous for the future of humankind.

Figure 3.5 Public attitudes to genetic research



The global measure regarding potential benefits of genetic research indicated that the public was generally quite positive toward genetic research. However, there were some reservations regarding the ethics of genetic research. Genetic research is multi-dimensional and there has been a lot of controversy surrounding certain types of research such as stem cell research. Alongside a global analysis of public attitudes, the survey assessed whether the public approved of specific types of genetic research such as stem cell research using adult and human embryo tissue, cloning of human cells and the development of genetically modified foods.

Differences emerged in relation to approval of specific types of genetic research. As demonstrated in table 3.7, these discrepancies did not appear to be due to a lack of awareness as the public appeared to be quite well informed (i.e. less than 10% reported they had never heard of any of the listed forms of genetic research).

Highest approval levels were reported for stem cell research using adult human tissue (49%) and for cloning human cells to combat disease (42%). Conversely, disapproval was highest for the development of genetically modified foods (52%) and stem cell research using human embryos (34%). A significant minority, from a quarter to a third, were undecided about each of these issues.

Table 3.7 Public approval for specific types of genetic research

	Approve %	Unsure %	Disapprove %	Have not heard of: %
Stem cell research involving adult human tissue (n = 2,036)	49	27	16	8
Cloning human cells to combat diseases (n = 2,035)	42	28	26	4
Stem cell research involving human embryo tissue (n= 2,037)	30	30	34	6
Development of genetically modified food or crops (n= 2,037)	21	23	52	4

Findings regarding approval for stem cell research involving adult human tissue here were comparable to previous Irish figures from the Eurobarometer (2002). The Eurobarometer study found that half the Irish public considered stem cell research to be useful. However, it should be noted that only 37% considered it to acceptable and 40% believed it should be encouraged. Unlike the current study, the Eurobarometer (2002) did not ask participants to distinguish between use of adult human tissue and human embryos. In relation to the development of genetically modified food, figures from the current study (approval rate of 21%) indicate that the Irish are less in favour of these than they were in the 2002, when 34% considered GM food to be acceptable and 39% to be useful. However only 32% believed it should be encouraged and 39% perceived it to be risky (Olofsson, 2004).

3.6.3 Attitudes towards researchers and governing authorities [3]

Consistent with positive attitudes to medical and genetic research in general, only 10% felt that researchers were motivated by selfish reasons such as money or fame. In contrast, a Dutch study comparing cancer trial participants and non-participants towards clinical research, found that 34% of participants and 23% of non-participants believed that medical research is primarily performed to promote doctors' careers (Madsen, Mirza, Holm, Hilsted, Kampmann & Riis, 2002).

Almost one third (33%) of participants in the current study believed that researchers are motivated by altruistic reasons and a further 48% believed that they are motivated by both altruistic and selfish reasons. The MRC (2001) focus group study of public perceptions of the collection of human biological samples in the UK also found that participants believed researchers involved in medical and genetic research to be motivated by both selfish and altruistic considerations.

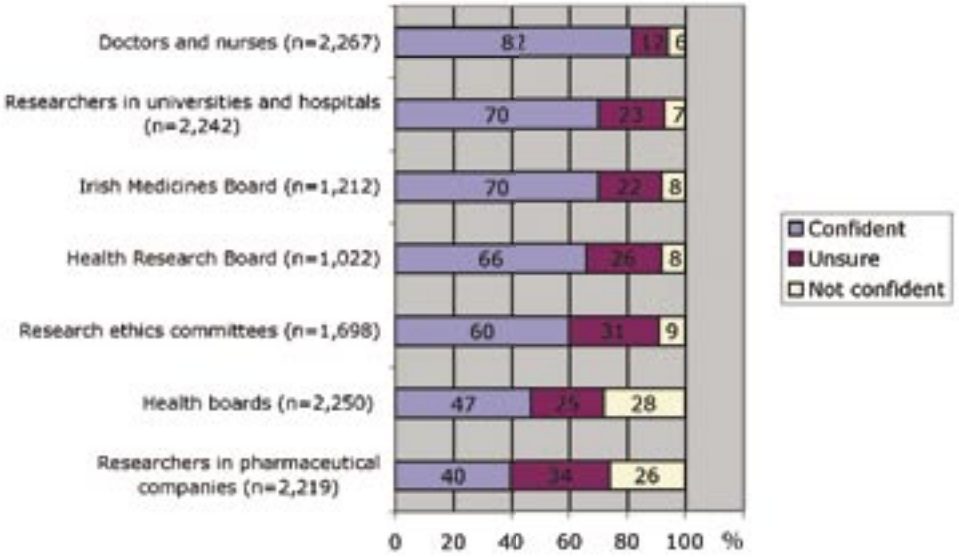
Attitudes concerning the ability of various health-related governing authorities to assess the benefits and risks involved in medical research were evaluated. Authorities of interest to this study included the Health Research Board (the national research agency with primary responsibility for health-related research); the Irish Medicines Board (the national agency with responsibility for licensing pharmaceutical products for use in Ireland); institutional research ethics committees; the Department of Health and Children; health boards; researchers in pharmaceutical companies; researchers based in universities and hospitals; and doctors and nurses. It was felt that some of these groups might be relatively unknown to the general public. To avoid redundancy, only those who reported having heard of the Irish Medicines Board and the Health Research Board were asked for their opinion regarding their level of confidence. Forty-seven per cent of participants had heard of the Health Research Board, 49% had heard of the Irish Medicines Board and 35% had heard of research ethics committees.

Public confidence in research ethics committees was of particular interest to this study, as they are ultimately responsible for the decision to allow a particular research study to go ahead. Furthermore, participants had to consider various hypothetical scenarios which involved research ethics committee approval. However, only one third of the public knew about research ethics committees. Similar findings were revealed in a study in Denmark, albeit a decade ago in 1995, where 30% of participants were aware of the existence of research ethics committees (Madsen, Holm & Riss, 1999). All participants in

the present study were given a brief definition of the role of a research ethics committee so that views on research ethics committees could be measured using the entire sample. Figure 3.6 illustrates public confidence in the various authorities.

Participants had most confidence in the ability of individuals: in particular doctors and nurses (82%) and then hospital/university based researchers (70%), to evaluate the risks and benefits of medical research. Sixty per cent of participants reported having confidence in research ethics committees. Confidence in research ethics committees has been found to be important, as Madsen et al (2002) and Madsen, Holm et al (1999) found that the majority of cancer trial participants stated that the presence of a research ethics committee had an impact on their decision to participate. Health boards and researchers in pharmaceutical companies received the lowest ratings, with over a quarter (28% and 26% respectively) not confident in their ability to evaluate risks. However almost a quarter (or a third in some cases, e.g. researchers in pharmaceutical companies) of participants were unsure about the ability of these authorities (figure 3.6).

Figure 3.6 Confidence in the ability of various agencies and groups to assess benefits and risks involved in medical research



Consistent with high levels of confidence in the ability of doctors and nurses to assess risks and benefits of medical research, most but by no means all participants reported that they would also trust a doctor to fully explain what research participation involves when recruiting participants (73%).

3.6.4 Beliefs about medicines

Participants' beliefs about medicines were assessed using the General-Harm subscale of the Beliefs about Medication Questionnaire. Participants indicated their degree of agreement with four statements about medicines on a 5-point scale. These responses were summed to create a general harm sub-scale score, which ranges from 4-20. A score of 20 indicates complete agreement with the concept that medicines are harmful, addictive, shouldn't be taken for long periods and/or are less safe than natural remedies. The current study found a mean score of 11.9, thus indicating a slight tendency to agree with this general harm concept.

3.7 Willingness to allow use of excess surgical tissue for research purposes

When presented with the hypothetical situation of having surgery and subsequently being asked if their 'excess' surgical tissue (i.e. material which was properly removed as part of surgery and which is surplus to that needed to be stored/tested for patient care purposes) could be used in a research study, the majority was willing to allow such use of their tissue (86%). Of this 86%, 5% stated that their willingness would depend on the type of tissue involved. This high level of willingness is consistent with that found in a national study of the Swedish public, with 86% reporting that they would agree to donate a blood sample for research purposes (Lindblad et al submitted for publication). Another Swedish study of 1,000 participants found that 71% of participants would agree to the use of a donated tissue sample for genetic research (Hoyer et al, 2004). Similarly, a nationally representative study of US households found that the majority of participants consented to have their blood samples included in a national repository for genetic research (84% in 1994 and 85% in 2000)(McQuillan, Porter, Agelli & Kington, 2003).

However, consent rates for the use of human tissue for medical or genetic research are not consistently high. For example, an American study of prospective jury members found 60% willing to donate tissue for genetic research (Merz & Sankar, 1998). Similarly, Wang et al (2001) found that only 53% of the American public were willing to donate blood for genetic research. Trauth et al (2000) found that 46% of participants would be willing to take part in medical research, the use of human tissue was not specified in this study. In contrast to most studies, Goodson & Vernons' (2004) study of 100 UK volunteers in a dental clinic found that a large majority were unwilling to donate specific types of tissue, for example 50% would consent to use of bone tissue, 54% to tissue of the eye and 58% to tissue of the brain and lungs. However, 74% would be willing to donate tissue of the head and neck and 71% ovarian/testicular tissue.

Of those willing to allow use of their excess surgical tissue in this study, the most common motive was for the potential benefits there may be for the health of the participant's family in the future (96%), followed by the potential benefit there may be to one's own health (92%). A sense of duty as a citizen for the potential benefit of future patients motivated 80% of participants. This sense of being motivated by altruistic feelings corresponds with previous research. For example, Lindblad et al (submitted for publication) found the most common motives for donating a blood sample were the potential benefit for future patients (89%) and the potential benefit for oneself or family (61%). Madsen et al (1999) also found that one third of cancer trial participants felt a moral obligation to participate due to the potential benefits to the participant and his or her family. The desire to help future patients was also considered to be of great importance.

Consent to allow the use of tissue for research purposes is generally obtained by doctors involved in the patient's care. However, this same doctor is often also involved in the research project for which consent is being sought. Consequently, patients may feel obliged to participate (Goodson and Vernon, 2004; Clayton et al 1995). This was not found to be the case among the current sample. A minority of participants reported that they would be motivated by a concern that their refusal to allow use of their excess surgical tissue would negatively affect their relationship with doctors or nurses (11%) or negatively affect their healthcare (15%). Although these figures were higher than in the Swedish study conducted by Lindblad et al (submitted for publication) where only 2% reported being motivated by a concern that refusing would interfere with their relationship with healthcare personnel.

Willingness to allow use of excess surgical tissue for research was based on the hypothetical scenario of being asked post-operatively in a hospital. In order to determine whether the funding agency financing the research would influence this decision, participants were asked whether they would be willing to allow their excess tissue to be used in research funded by the government and by a pharmaceutical company. Almost three quarters (74%) reported that they would be willing to contribute to a government funded study, whereas only 51% would be willing to contribute to a study funded by a pharmaceutical company. Similar concern about the involvement of pharmaceutical companies in medical research has been reported in other studies (Hoyer et al, 2004: Medical Research Council, 2001). In contrast Lindblad et al (submitted for publication) found that 68% would not be influenced by the financial source of the research.

3.7.1 Factors associated with willingness to allow use of excess surgical tissue for research

Univariate analysis was conducted to identify factors which may be associated with willingness to allow use of excess surgical tissue for research. Associations were examined according to three categories of variables: demographic factors; medical and healthcare experiences; and attitudinal factors. Attitudinal factors were further categorised into attitudes to medical research; to genetic research; confidence in governing authorities to assess benefits and risks of research; and attitudes to the organ retention controversy. Factors found to be significantly related to willingness to contribute excess surgical tissue are presented in table 3.8.

While table 3.8 highlights the importance of several demographic, experiential and attitudinal factors, it fails to establish which factors are most important in the multivariate prediction of willingness to allow use of excess surgical tissue for research. In order to identify the most important predictors, multivariate logistic regression analysis was conducted using those factors, which were significant at a univariate level. Before this analysis was conducted, the various measures regarding attitudes to medical and genetic research were combined to form one single item. Similarly, confidence in the various health authorities were combined into a single comprehensive item of confidence. Reduced confidence in various authorities since the organ retention controversy were also combined to form one item.

Table 3.8 Univariate predictors of willingness to allow use of excess surgical tissue for research

Predictor	OR	95% Confidence Interval
Demographic factors		
Higher levels of education	1.7***	1.39-2.09
Not having a medical card	1.4**	1.11-1.84
Having children	1.4*	1.07-1.74
Religious/spiritual beliefs important	1.2*	1.02-1.34
Medical and healthcare experiences		
Having a genetic condition (self)	1.7**	1.16-2.37
Family member with a genetic condition	1.5*	1.07-1.99
Donated blood in the past	1.8***	1.37-2.36
Willing to donate organs after death	4.9***	3.64-6.63
Post-mortem conducted on a deceased family member	1.4*	1.05-1.85
Aware of tissue storage	1.5**	1.10-1.99
Attitudes to medical research		
Research results in new and improved treatments (Agree)	3.6***	2.29-5.74
Research helps us live longer (Agree)	1.7**	1.20-2.29
A lot of medical research is unnecessary (Disagree)	1.7***	1.27-2.19
Attitudes to genetic research		
Genetic research will cure diseases (Agree)	2.1***	1.61-2.65
Genetic research is tampering with nature (Disagree)	1.4**	1.08-1.74
Approval of stem cell research using adult tissue	3.3***	2.47-4.30
Approval of stem cell research using human embryo tissue	3.8***	2.66-5.51
Approval of cloning of human cells to combat disease	2.4***	1.82-3.17
Approval of genetically modified foods	2.7***	1.85-4.08
Beliefs about medicine		
General-harm subscale (Less likely to agree)	0.86***	0.82-0.91
Attitude to researchers Belief that researchers are motivated by altruistic reasons	1.8***	1.34-2.41
Desire for feedback		
Desire feedback regarding genetic risk for an inherited disease	2.0**	1.26-3.01
Confidence in health authorities		
Confidence in research ethics committees in hospitals and universities	1.5***	1.30-1.80

Predictor	OR	95% Confidence Interval
Department of Health and Children	1.2*	1.02-1.31
Doctors and nurses	1.2**	1.05-1.40
Researchers at universities and hospitals	1.6***	1.43-1.89
Motives - influenced by:		
A sense of duty to contribute	5.2***	4.08-6.75
Potential benefits to own health	3.2***	2.32-4.34
Potential benefits to health of family	6.6***	4.70-9.28
Organ retention controversy		
Aware of organ retention controversy	2.4***	1.59-3.54
Belief that current safeguards prevent future problems like this	1.7***	1.25-2.21
Reduced confidence in authority since organ retention controversy		
Hospital doctors (Disagree)	1.4***	1.24-1.52
Pathologists (Disagree)	1.5***	1.35-1.67
Family doctors (Disagree)	1.2**	1.08-1.44
Managers of hospitals (Disagree)	1.3***	1.14-1.41
Department of Health and Children (Disagree)	1.3***	1.16-1.43
Researchers (Disagree)	1.5***	1.32-1.65

*$p \leq 0.05$; **$p \leq 0.01$; ***$p \leq 0.001$

When assessing socio-demographic characteristics adjusting for covariates in the first model, the following associations remained significant: educational level and having children. The inclusion of medical and healthcare experiences in a second model resulted in educational level and having children remaining statistically significant, other factors which were found to be significant were being willing to donate organs after death and being aware of tissue storage. The final model incorporated the various attitudinal measures. Those factors which were independently related to willingness to allow use of excess surgical tissue for research are presented in table 3.9.

Table 3.9 Multivariate predictors of willingness to allow use of excess surgical tissue for research purposes (n=2,160)

	OR	95% Confidence Interval
Higher levels of education	1.60**	1.09-2.33
Having children	3.04***	1.93-4.79
Willing to donate organs after death	3.10***	1.82-5.18
Aware of tissue storage	1.76*	1.03-2.99
Positive attitudes to medical and genetic research	1.48***	1.30-1.68
Belief that researchers are motivated by altruistic reasons	1.84*	1.10-3.08
Feel a sense of duty as a citizen to allow use of tissue	4.04***	2.56-6.37

*****$p< 0.05$; **$p<0.01$; ***$p<0.001$*

In relation to demographic factors, participants who reported higher education and having children were significantly more likely to be willing to allow use of their excess surgical tissue. In relation to educational level, there were no significant differences between those who had 'incomplete second level' and 'complete second level' education. For this reason these two groups were combined to form 'second level'. Participants with third level education (93%) were significantly more likely to be willing to allow their excess surgical tissue to be used for research than those with either primary (81%) (OR 0.33, 95% CI 0.20-0.54, $p<0.001$) or secondary education (88%) (OR 0.55, 95% CI 0.35-0.88, $p=0.012$). Lindblad et al (submitted for publication) also found having children and being highly educated to be important predictors of willingness to donate a blood sample for genetic research, when adjusting for covariates. Other studies revealed similar educational differences (Wang et al 2001; Trauth et al 2000). In contrast to current findings, Trauth et al (2000) found that having children had a negative influence on willingness to participate in medical research, as 43% of their participants with children were willing to participate compared to 56% of those without children ($p=0.003$). However, the study by Trauth et al focused on research participation (rather than tissue donation) which may be influenced by time constraints, and having children may impede one's ability to find time to participate, rather than allowing use of excess surgical tissue, which involves no additional burden.

Willingness to donate organs for transplantation after death was also significantly related to willingness to allow use of excess surgical tissue (table 3.9). Over 90% of participants who reported being willing to donate organs were also willing to allow use of their excess surgical tissue compared to 67% of those who are not willing to donate organs. Lindblad et al (submitted for publication) also found being a blood donor to be significantly related to willingness to donate a blood sample. Similarly those participants who were aware of tissue storage were also significantly more likely to allow use of their tissue.

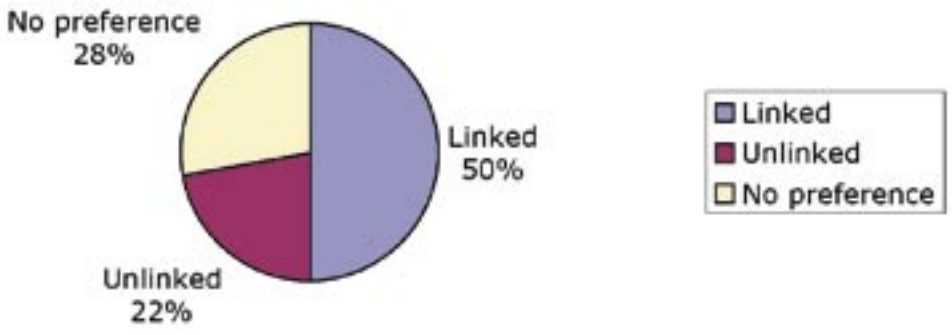
Participants who reported positive attitudes to medical and genetic research were significantly more likely to allow use of their tissue for research (table 3.9). These findings are consistent with the national Swedish study which found that participants who held negative attitudes to genetic research were significantly less likely to be willing to donate blood for research (Lindblad et al. submitted for publication). Furthermore, the belief that researchers are motivated primarily by altruistic reasons as opposed to selfish reasons or both selfish and altruistic reasons, were significantly more likely to be willing to allow use of their excess surgical tissue (table 3.9)

In conclusion, factors which were associated with being willing to allow use of excess surgical tissue for research included, higher level of education, having children, willing to donate organs for transplantation, awareness of tissue storage as part of one's medical record, positive attitudes towards medical and genetic research, believing that researchers are primarily motivated by altruistic reasons and feeling a sense of duty as a citizen for the potential benefit there may be to future patients.

3.8 Stored tissue samples - preferences for linked or unlinked samples

Of those who reported that they were willing to allow their excess surgical tissue to be used for research purposes, 87% were also willing to allow this tissue to be stored for future research. Participants were then informed that tissue samples may be stored as linked or as unlinked samples. Following a brief explanation of what linked and unlinked means, participants indicated their preference for a linked or an unlinked model of storage (figure 3.7).

Figure 3.7 Preferences for linked or unlinked storage of tissue samples (n= 1,738)



Half of those willing to allow their tissue to be stored for future research reported a preference for a linked model of storage, 22% for an unlinked model and 28% had no preference. Willingness to allow tissue samples to be stored under a linked model was considerably lower among the Irish public than the comparable Swedish study, where 86% would consent to the donation of a blood sample under a linked model (Lindblad et al. 2004). In the present study the value of linked samples was explained briefly to those who indicated that they would prefer an unlinked model or had no preference. The explanation given was as follows:

'*Tissue samples are of much greater value to research when they are linked. For example, if researchers want to see whether a disease has responded to treatment, they can only find this out if they have linked information and can check your medical record'.*

With this additional information regarding the benefit of a linked model, 77% of those who initially had no preference or chose an unlinked model, indicated that they would be willing to allow their tissue to be stored under a linked model. Eight percent were unwilling and a further 15% were unsure. Thus overall 89% were willing to agree to linked model tissue donation. These findings suggest that when members of the public are provided with information about the benefits of being able to link tissue samples to medical records, they are willing to allow their samples to be stored under a linked model. This question expands our understanding from the methods used in previous studies. It is however, also possible to point out the risks of participating in this way to those who were in favour of a linked model (e.g. by raising concerns about privacy etc.). This was not done here and it is not known how many individuals would reject a linked model if possible risks were pointed out. This question would be a useful addition to future research protocols.

3.9 Desire for feedback

Participants were asked to consider a hypothetical situation where they allowed blood or tissue samples to be used for research. They were then asked whether they would want '*general information regarding the results of the study overall*'. The majority of participants (69%) indicated that they would like to receive such information, 17% would not like to be informed (table 3.10). This desire to be informed about general results emerging from studies using one's sample is consistent with other studies (Asai et al. 2002; Merz & Sankar, 1998; Wendler & Emanuel, 2002).

Table 3.10 Desire for feedback regarding research results and genetic predisposition to disease

Desire information regarding:	Yes %	No %	Unsure %	It depends %
Overall results of the stud (n = 2,286)	69	17	5	9
Own genetic risk of an inherited disease (n=2,274)	83	8	6	3
Own genetic risk of an inherited disease that cannot be prevented or treated (n =2,069)	71	18	11	N/A

There was a stronger desire for information regarding one's own genetic risk for an inherited disease, with 83% reporting that they would like such information. Only 8% would not like to be informed, 6% indicated that they were unsure and 3% reported that it would depend (table 3.10). Similarly, 83% of the Swedish public reported that they would like feedback regarding their genetic predisposition to disease (Hoyer et al. 2004). In contrast, Ring & Lindblad (2003) found that only 39% would like information regarding their personal risk for hereditary diseases.

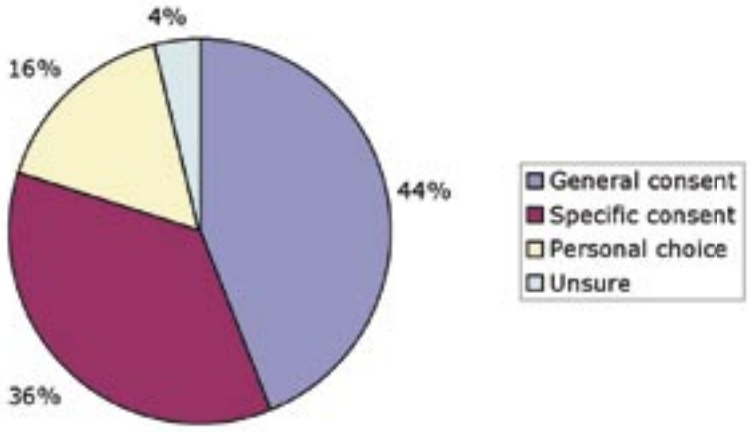
Previous research has shown that desire for feedback regarding one's genetic predisposition for disease varies depending on whether the disease is preventable or treatable (Hoyer et al. 2004; Lindblad et al. submitted for publication). Therefore participants in this study were asked '*If researchers found that you were at risk for an inherited disease that could not be prevented or treated, would you want to know?'.* Seventy-one percent reported that they would still like to receive feedback even if the disease was not preventable or treatable, 18% did not want to receive such information and 11% were unsure (table 3.10). These findings are in contrast to other studies, which report a lower desire for feedback when the disease was not preventable or treatable. For example, Hoyer et al. (2004) found that only 26% of participants would like feedback regarding genetic predisposition regardless of whether the disease was preventable or not and 55% would like to be informed only if there was a treatment or preventive intervention available. Similarly, Ring & Lindblad (2003) found that 44% of their sample wanted this information only if the disease was preventable or treatable. Lindblad et al (submitted for publication) reported a higher proportion (47%) who would like feedback regarding hereditary disease regardless of the context. This figure is still much lower than that found in the current study.

3.10 Consent preferences

Much of the ethical debate surrounding informed consent procedures centres around the necessity of informed consent for re-use of archived tissue for research purposes. This study proposed three possible options for participants: 1) those who allow their tissue to be stored for research are asked for permission to use this tissue before each study (specific consent); 2) those who allow their tissue to be stored for research are asked for permission to use this tissue once, with subsequent studies needing ethics committee approval but not individual consent (general consent); and 3) those who agree to tissue storage are asked at the outset whether they want to provide general or specific consent (personal choice).

When this sample was asked to consider these three options, a slight majority favoured the notion of general consent (44%) followed by specific consent (36%). Personal choice was considered desirable by 16% and a further 4% were unsure (figure 3.8).

Figure 3.8 Consent preferences for use of archived tissue for research purposes (N=2,116)



Those who indicated personal choice as most desirable (n=309), were then asked what their personal preference would be if they had to decide. Forty-five percent considered specific consent as most desirable, followed by general consent (39%). A further 16% were unsure. Taking this sub-group's preferences into account, just over half the sample (51%) supported general consent, 43% supported specific consent and a further 6% were unsure. These findings are consistent with the conclusion of Asai et al (2002) that members of the public are likely to have conflicting attitudes to the necessity of specific consent. A slightly higher preference for general consent is consistent with findings from Ring and Lindblad (2003), where 46% of participants supported general consent. Hoeyer et al (2004) found higher levels of support with 67% endorsing the concept of general consent.

In order to identify factors which were associated with consent preferences, participants who were unsure were excluded from the analysis. Univariate analyses were initially conducted according to the three categories as examined in relation to willingness to allow use of tissue (demographics; medical and healthcare experiences; and attitudinal factors). Willingness to allow use of excess surgical tissue was also examined. Factors which were found to be univariately related to consent preference are presented in table 3.11.

Table 3.11 Univariate predictors of consent preferences (response associated with general consent)

Predictor	OR	95% Confidence Interval
Demographic factors		
Education (Lower education)	1.1*	1.02-1.21
Age (Older age groups)	1.3***	1.18-1.39
Worked in health sector (No)	1.4*	1.04-1.86
Children (Yes)	1.66***	1.38-2.00
Medical and healthcare experiences		
Health status (Poorer health)	1.23***	1.13-1.34
Long-term prescribed medication (Yes)	1.4***	1.16-1.71

Blood donation (Yes)	1.3**	1.07-1.54
Hospital in-patient (Yes)	1.5***	1.20-1.91
Blood test (Yes)	1.93***	1.45-2.57
Tissue test (Yes)	1.3**	1.06-1.51
Attitudes to medical research		
Research results in new and improved treatments (Agree)	1.8*	1.09-2.96
A lot of medical research is unnecessary (Disagree)	1.43***	1.15-1.78
Attitudes to genetic research		
Genetic research will cure diseases (Agree)	1.4***	1.17-1.62
Genetic research is tampering with nature (Disagree)	1.23*	1.03-1.48
Approval of stem cell research using adult tissue (Approve)	1.9***	1.64-2.39
Approval of stem cell research using human embryo tissue (Approve)	1.7***	1.45-2.16
Approval of cloning of human cells to combat disease (Approve)	1.8***	1.49-2.16
Approval of genetically modified foods (Approve)	1.4**	1.14-1.77

Predictor	**OR**	**95% Confidence Interval**
Willing to allow use of excess surgical tissue for research (Yes)	5.0***	3.66-6.81
Confidence in health authorities		
Irish Medicines Board (Confident)	1.3***	1.10-1.50
Health Research Board (Confident)	1.4***	1.18-1.66
Research ethics committees in hospitals and universities (Confident)	1.23**	1.09-1.40
Researchers at universities and hospitals (Confident)	1.14*	1.016-1.28
Organ retention controversy		
Belief that current safeguards prevent future problems like this (Yes)	1.6***	1.27-1.90
Failure of hospitals to ask families for permission to remove organs from the deceased (Considered minor/no problem)	1.6**	1.14-2.21
Disposal of organs without family consultation (Considered minor/no problem)	2.4***	1.60-3.53

Reduced confidence in authority since organ retention controversy		
Hospital doctors (Disagree)	1.3***	1.22-1.44
Pathologists (Disagree)	1.3***	1.21-1.44
Family doctors (Disagree)	1.2**	1.01-1.35
Department of Health and Children (Disagree)	1.1*	1.01-1.19
Researchers (Disagree)	1.2***	1.12-1.33

*p<0.05; **p<0.01; ***p<0.001

A multivariate logistic regression was then carried out to determine which factors remained independently significant. Those factors which were significantly related to general consent are presented in table 3.12. Attitudes to medical and genetic research which were found to be univariately significant were combined into a single 'attitude to medical and genetic research' item. Similarly confidence in the health authorities which were univariately significant were combined into one single item of confidence. The same was applied to those univariately significant items regarding reduced confidence since the organ retention controversy.

When assessing socio-demographic characteristics adjusting for covariates in the first model, having children and age were the only variables remaining significant, such that younger participants were significantly more likely to report a preference for specific consent (56%) than those aged 65 years and over (39%) (OR 1.9, 95% CI 1.47-2.58, p<0.001). All other age groups favoured general consent.

The inclusion of medical and healthcare experiences in a second model resulted in age remaining statistically significant, having children did not remain significant. Other factors which were found to be significant were health status and experience of a blood test. Participants who rated their health positively were significantly more likely to consider specific consent whereas those reporting more negative health status were more likely to indicate a preference for general consent. Similarly, those who reported having had a blood test were significantly more likely to support general consent (56%) compared to those who have never had a blood test (39%).

The final model incorporated the various attitudinal measures and willingness to allow use of excess surgical tissue for research. The final model emerging as presented in table 3.12, shows those factors which were independently related to consent preferences. Age, health status and experience of a blood test remained significant. Participants who reported being willing to allow their tissue to be used for medical research (59%) were significantly more likely to support general consent than those who were unwilling (22%) (table 3.12). Similarly, participants with positive attitudes to medical and genetic research were significantly more likely to prefer the option of general consent.

Unlike willingness to allow use of surgical tissue for research, the organ retention controversy appeared to influence participants' judgements regarding consent preferences. More specifically, those who had more confidence that the events of the organ retention controversy are a thing of the past and unlikely to happen again due to the adequacy of current safeguards, were significantly more likely to favour general consent (60%) compared to those who believed it could happen again in the future (49%).

Table 3.12 Multivariate predictors of general (vs specific) consent preferences (n= 1,911)

	OR	95% CI
Older age	1.0**	1.00-1.01
Poorer health status	1.2**	1.04-1.33
Experience of a blood test	2.0***	1.30-2.89
Willing to allow use of excess surgical tissue for research	5.6***	3.63-8.77
Positive attitudes to medical and genetic research	1.15***	1.08-1.23
Less likely to report reduced confidence in health authorities and personnel since the organ retention controversy	1.2*	1.01-1.42

*p<0.05; **p<0.01; ***p<0.001

3.10.1 Use of archived tissue when the donor is non-contactable

There are various other circumstances where it is unclear what type of informed consent is necessary. These include when a person who originally allowed tissue to be stored for research is no longer contactable (including where the person has died). Participants were asked to consider the following scenario, *"A person who allowed their left-over tissue to be stored for future research cannot be re-contacted to get permission for example, they changed address or died. Do you think it is acceptable to use their tissue in new studies approved by an ethics committee?".* Over half the sample (55%) considered it acceptable to use archived tissue under such circumstances, a further 31% considered it unacceptable and 14% were unsure. Two Swedish studies yielded similar results. Lindblad and Ring (2003) found that 41% reported that use of archived samples from deceased donors was acceptable provided a research ethics committee had approved of the study. Hoyer et al (2004) also found that 48% of participants considered it acceptable for a research ethics committee to decide whether stored samples are used for research if the person is deceased and relatives have been approached.

Participants who were in favour of general consent (OR 0.32, 95% CI 0.26-0.39 p<0.001) and those who indicated that they would be willing to contribute their excess surgical tissue for research purposes (OR 5.6 95% CI 4.17-7.59 p<0.001) were significantly more likely to consider the use of archived tissue samples in the absence of consent as acceptable when the donor is no longer contactable (table 3.13).

Table 3.13 Acceptability of the practice of using archived tissue samples in the absence of informed consent

	Acceptable to use archived samples %	Unacceptable to use archived samples %
Consent preferences* (n= 1,716)**		
General consent preferred	76	24
Specific consent preferred	50	50
Willingness to contribute excess surgical tissue * (n= 1,939)**		
Willing	69	31
Unwilling	28	72

*p<0.05; **p<0.01; ***p<0.001

This suggests that there was a group of individuals who were more liberal in their attitudes to informed consent. These individuals were willing to donate their tissue for research and considered providing general consent as sufficient to meet their entitlement to provide consent for future studies. They also considered the use of archived tissue samples in the absence of consent when the person is non-contactable as acceptable.

3.11 Organ retention controversy

As described earlier, the controversy over the removal, retention, storage and disposal of human organs following post-mortem is deeply emotive. The British Retained Organs Commission (2002) argued that the organ retention controversy has led to widespread suspicion and erosion of trust in the honesty of the medical profession. Burton & Wells (2002) reiterated this sentiment, claiming that public confidence in the medical profession has been damaged in recent years by several serious incidents including the retention of organs and the media fuelled storms that followed. A report in the Irish Medical Times (17/08/01) suggested that pathologists in Britain were coming under attack from members of the public over the organ retention scandal.

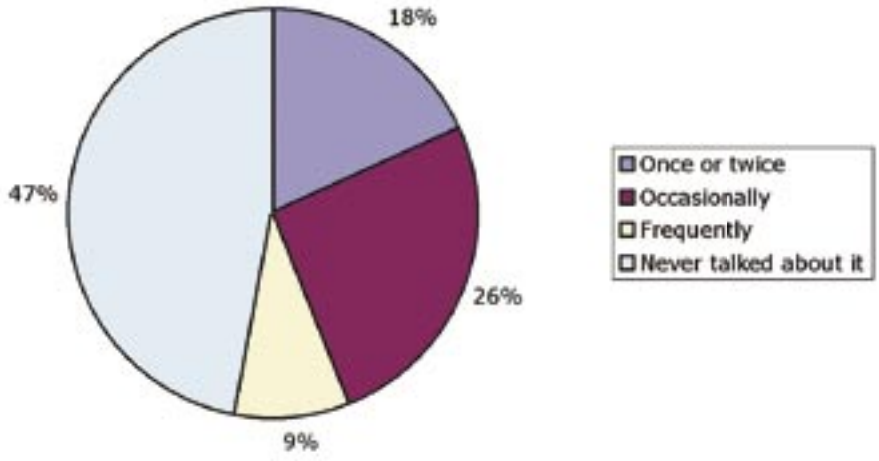
Ireland has witnessed similar media coverage of the organ retention controversy. However at the time of the survey (second half of 2004, early 2005) the Dunne inquiry was ongoing. One objective of the current study was to determine public awareness, level of engagement and attitudes towards the organ retention controversy and to identify the relationship of this issue to public confidence in the healthcare system.

3.11.1 Level of engagement in the organ retention controversy

Information was gathered regarding public engagement in the organ retention controversy. This method of classification was adopted from the Eurobarometer 58.0 (2003), which defined the engaged public as "people who are more aware, knowledgeable and behaviourally involved in a subject" (p. 2). In order to ascertain the public's level of engagement, participants were asked whether they had heard of the cases, whether they had discussed them with anyone and whether they had read newspaper articles or listened to radio reports about the issue.

The majority of participants (94%) surveyed in the latter part of 2004 indicated that they had heard of the organ retention controversy. Similarly, the majority (95%) reported reading newspaper articles or listening to radio reports about this issue. However, just over half (53%) reported that they had discussed this issue with others. Fig 3.9 demonstrates how frequently participants talked about this topic with others.

Fig 3.9 Frequency with which the public discussed the organ retention controversy (n=2,161)



These findings suggest that the public were reasonably aware of the organ retention controversy. Many were aware of the controversy and informed themselves through newspaper and radio reports. Fewer people had actively discussed the issue with 47% reporting never having talked about it with anyone (figure 3.9).

It appears that the Irish public were more informed than the British public, as only 34% of participants in a UK study (N=1,800) reported being aware of the organ retention controversy (Retained Organs Commission, 2003). This discrepancy may be accounted for in part by the fact that the UK study included younger participants (they interviewed participants aged 15 years and upwards) whereas the current study sampled participants aged 18 years and upwards. Furthermore, it is likely that Irish study participants were more exposed to media reports as the study was conducted one year after the UK study. Despite high levels of awareness among the Irish public regarding the controversy itself, less than half the participants (44%) had heard of the Dunne Inquiry.

Participants were also asked whether they were interested in the cases of the unlawful retention of organs following post-mortem. Of the 69% who indicated that they were interested in these cases, 93% reported that this interest was of a general nature. A further 5% indicated that they were personally involved (i.e. they knew of cases where organs had been retained without permission) and 2% had a professional interest.

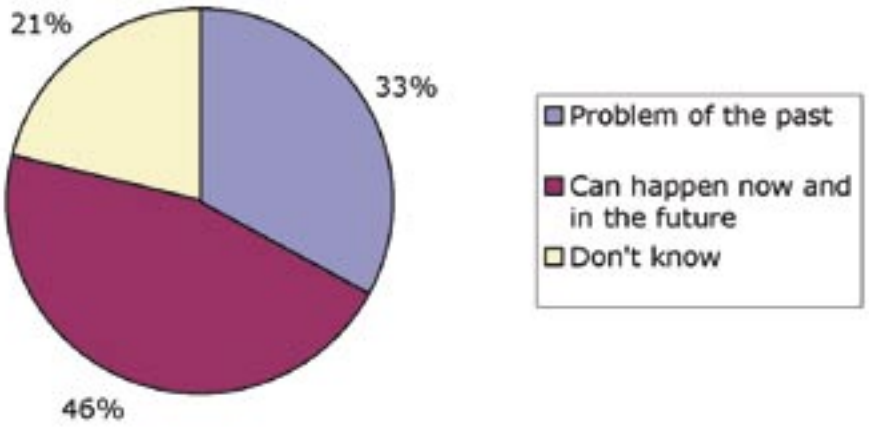
3.11.2 Attitudes to safeguards against the illegal retention of organs

Although 94% reported being aware of the controversy, researchers provided each participant with a brief definition of the controversy, in order to ask further questions on a common understanding of the facts of the situation. This also entitled those who said they were unaware to give an opinion. The definition provided was as follows: *'The organ retention controversy happened when families realised that organs of their next-of-kin were removed during post-mortems and then kept in hospitals without the family's permission. In some cases, hospitals later disposed of the organs without asking the family if they would like to bury the organs themselves'.*

Based on this description and their own prior knowledge of the events, participants were asked whether they felt that such events were the result of a lack of safeguards in the past and that, with ethics committees and other current safeguards, they would not happen again. The alternative option was that it could happen again in the future because there are not enough safeguards.

As demonstrated in figure 3.10, 46% of participants were not confident that there are enough safeguards to prevent such outcomes from occurring again. However, one third believed that there are now enough safeguards to prevent the re-occurrence of such events. A further 20% did not know.

Fig. 3.10 Beliefs regarding the potential of organs being retained in the future without permission (n=2,221)



3.11.3 Attitudes to doctors involved in the organ retention controversy

Jones, Gear and Galvin (2002) identified respect for the deceased as one of the key issues in this controversy. They argued that removal of organs from a deceased person following appropriate consent maintains the integrity of the deceased and their family. In contrast, when consent has not been given,

the body of the deceased is seen as having been desecrated. Biologically, the bodies of two deceased individuals are identical but symbolically they are very different. This begs the question as to why organs were removed without consent; was it because there was as lack of respect for the deceased person or their family or alternatively was it because the doctor did not want to cause further distress to the family who were in mourning?

About a quarter (24%) of the sample felt that doctors failed to ask for consent because they did not want to cause further upset to the family. A further 51% believed that doctors failed to ask families for permission because they did not want the added trouble of having to ask the family. A further 25% were unsure. Similarly, a qualitative study in the UK reported that a minority of participants believed that failure to ask for permission to conduct a post-mortem and retain organs may have been due to the doctors' desire to avoid distressing the family (Retained Organs Commission, 2002).

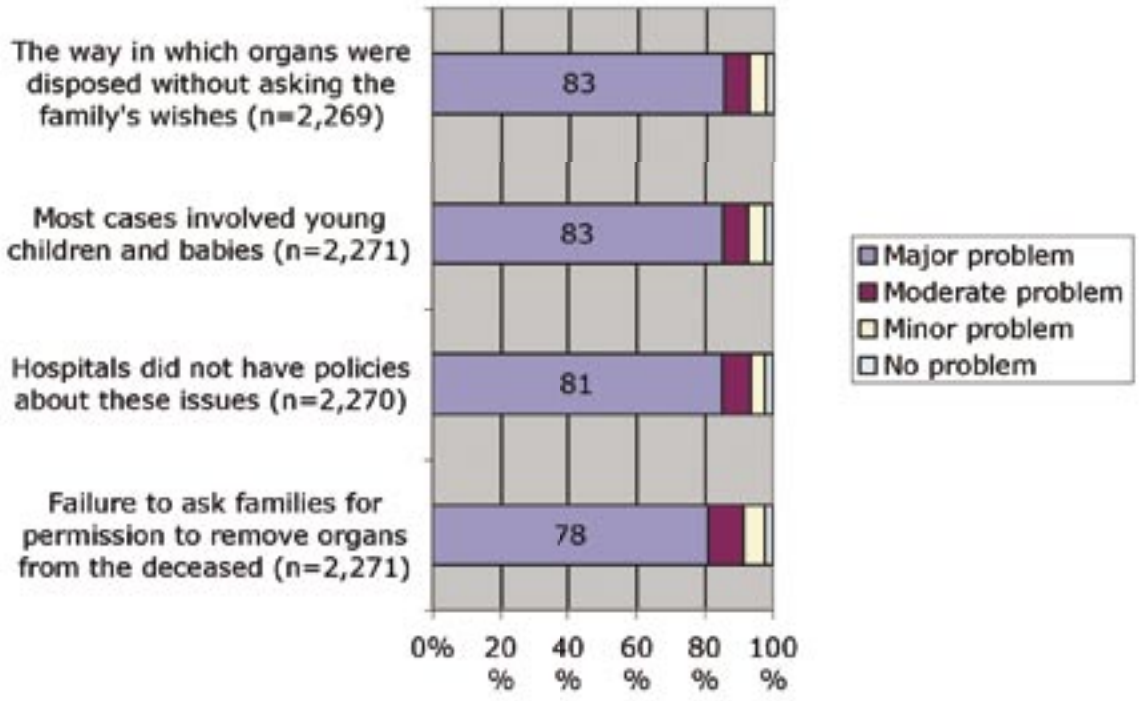
3.11.4 Key concerns regarding the organ retention controversy

In order to identify the focus of public concerns surrounding the controversy, participants were asked to consider the various issues (outlined in figure 3.11) and indicate whether they represented a major, moderate or minor problem or no problem.

Each issue appeared to be of equal significance, with approximately 80% indicating each factor mentioned as a major problem (figure 3.11). Disposal of organs without asking the family's wishes and the fact that most cases involved children were considered most problematic with 83% identifying them as a major problem. Furthermore, only 2% considered there to be no problem with each of the issues. The Retained Organs Commission (2002) qualitative study also identified failure to get proper consent and a lax approach to storage and disposal of retained organs as key concerns.

Participants were also asked to indicate whether they felt that the responses of hospitals and the Department of Health and Children were satisfactory when the controversy was uncovered. Seventy-eight percent were dissatisfied with the response of the hospitals concerned and how they dealt with the families involved. This is consistent with the finding that 81% considered the lack of hospital policies as a major problem (figure 3.11). Similarly, 70% considered the response of the Department of Health and Children as unsatisfactory. In contrast, 50% considered the media coverage of the controversy as satisfactory with 30% considering it to be unsatisfactory.

Figure 3.11 Key concerns regarding the Irish organ retention controversy

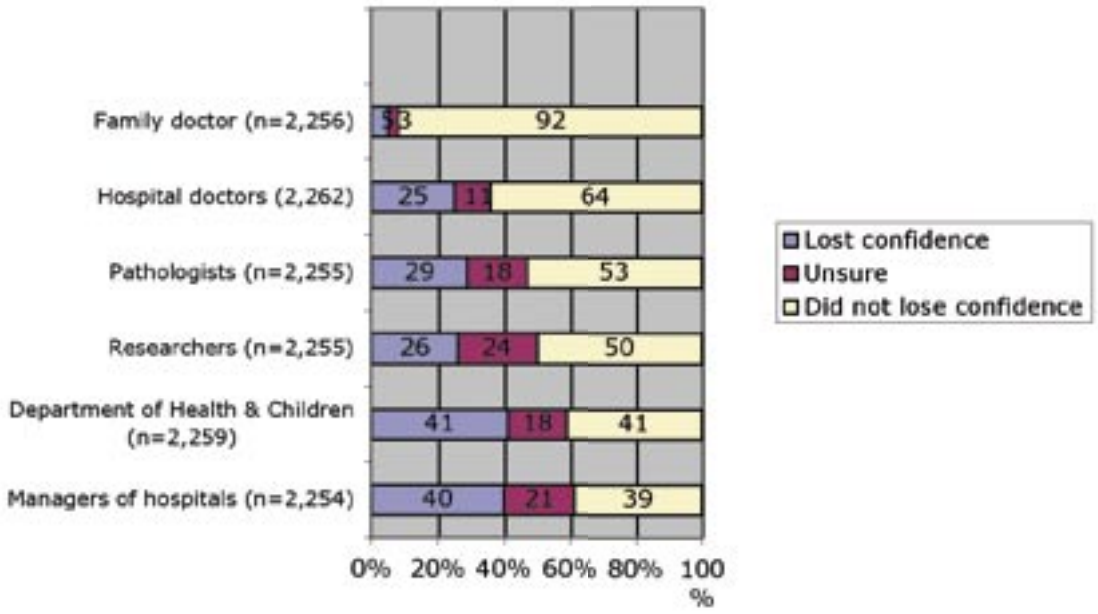


Despite largely negative attitudes towards the response of the hospitals and the Department of Health and Children, less than half (42%) felt that families who had organs of a deceased relative retained without consent should be financially compensated for the distress caused. Over a third (37%) believed they should not be compensated and a further 21% were unsure. This parallels the ambivalence about the right to compensation in other healthcare settings. For instance, in a recent Irish review of the European Charter of Patients' Rights, the right to compenasation was regarded as the only right out of a possible 14 rights (e.g. the right to information, access and personalised treatment) to be considered controversial (O'Mathúna, Scott, McAuley, Walsh-Danesh Mandi and Daly, 2005).

3.11.5 Public confidence in healthcare system and healthcare professionals following controversy

There has been much speculation that the events surrounding this controversy would reduce public confidence in the healthcare system and in health professionals. For example, Burton & Underwood (2003) believed that public confidence in and the reputation of post-mortem pathologists has been damaged. There has been no evidence on this issue in an Irish context. In order to quantify any changes in confidence, participants were asked to indicate whether this controversy had affected their confidence in various healthcare personnel and authorities [including doctors, managers of hospitals, management of health boards, the Department of Health and Children and researchers]. Results are shown in figure 3.12.

Figure 3.12 Loss of confidence in various health authorities/professionals since the organ retention controversy



Public confidence in their family doctor was least affected by the controversy, with 5% agreeing that their confidence has been affected. This was followed by hospital doctors (25%) and researchers (26%). Interestingly, confidence in pathologists was not as affected as might be imagined, as less than one third agreed that their confidence had been affected (figure 3.12). This is contrary to Burton & Wells' (2002) speculation in the UK context that the profession of pathology has been demonized in the eyes of the public. In the present study, pathologists were defined as 'doctors who conduct post-mortems', to clarify for members of the public who were unaware of their role. However, in Ireland public confidence in the Department of Health and Children (41%) and managers at hospitals (40%) appears to have been most affected by the controversy (figure 3.12).

This suggests that public confidence in individual doctors has been less affected than their confidence in public authorities involved (i.e. Department of Health and Children, hospital management). This finding is consistent with previous findings (reported in section 3.6.3) that the public were more confident in the ability of individual doctors than larger public authorities or institutions in relation to their ability to assess the benefits and risks involved in medical research. Participants were most confident in the ability of doctors and nurses (82%) and hospital/university based researchers (70%) to evaluate the risks and benefits of medical research. Researchers in pharmaceutical companies, research ethics committees, the Department of Health and Children received the lowest confidence ratings respectively (figure 3.6).

These findings are also consistent with the conclusions of a recent report regarding general population trust in public institutions in Ireland (2004). This report surveyed 500 members of the general public and concluded that the public are critical of the public sector, particularly in relation to it's openness and honesty in handling public mistakes, and the quality of management (MORI, 2004). Furthermore, they confirm other smaller Irish research studies on attitudes to doctors and medicine which found that many patients attending for healthcare had quite negative views about 'doctors in general' but mostly held very positive views about their own individual doctor (Conroy, Teehan, Siriwardena, Smyth, McGee & Fernandes, 2002). These findings appear to be part of a more general view about the trustworthiness of individuals (vs collectives or institutions). This pattern was also found in a recent study on the Irish public on clerical sexual abuse where most saw the institutional Church rather than individual priest as being responsible for the problem
(Goode, McGee & O'Boyle, 2003).

The implications of the findings as outlined here are considered further in the next chapter.

[1] The re-weighting procedure used was based on the Gross programme developed by Johanna Gomulka, which adjusts an initial weight so as to ensure that the distributional characteristics of the sample matches those of the population, according to a set of externally determined controls (Gomulka,1992). These latter are based on independent national sources such as the Census of Population 2002 and the Quarterly National Household Survey (the second quarter of 2004), both undertaken by the CSO

[2] State provided health cover for primary care services available to those with lower incomes

[3] In Coroner ordered cases, the family do not have a choice about whether a post-mortem is conducted

[3] This research was mostly completed before the highly publicised international withdrawal of pharmaceutical products such as Vioxx and other COX-2 inhibitor medications from the market in 2004. It is unclear if and how such events influence public opinion

4. DISCUSSION AND CONCLUSIONS

4.1 Introduction

The aim of this study was to provide nationally representative data regarding public views and experiences of medical research and related issues. This is the first such engagement of the general public in Ireland and fits with the aim of the current National Health Strategy - to consult and engage with the public on all matters pertinent to their health. Health-related research in Ireland, as an activity supported to a large extent by public funds, aims to contribute to the international effort to improve the health and well being of humankind. Those invited to participate in research may, in some situations, themselves benefit from the findings of the research. However, in most situations, the benefits are likely to be for others in the future. Thus research from the perspective of the individual participant is largely an altruistic activity. As all research participation is voluntary, it is therefore also a very fragile and valuable collective commodity. Without voluntary participation by individuals, there can be no research.

Research in health settings is by necessity staff intensive. Many high quality jobs can be created in a system with a high level of medical research. This aspect of health research is well recognised in national strategies such as 'Making Knowledge Work for Health' – the Health Research Board's policy document (2000). The scientific work involved can be seen as both 'science for health' and 'science for wealth'. The joint value to Ireland of medical research as science for health and science for jobs makes public support for, and participation in, medical research all the more necessary and valuable. The current report provides the first evidence on current issues in the research setting. It this provides a first important barometer of public views on research challenges in contemporary Irish society.

The specific issues addressed in this study included willingness to donate a tissue sample surplus to clinical requirements for medical research, involving issues such as preferences for linked or unlinked storage and desire for feedback regarding the research conducted using their tissue samples; preferences for informed consent concerning use and storage of human tissue for medical research; and awareness, and attitudes to the recent organ retention controversy. Predictors of willingness to allow use of excess surgical tissue and consent preferences were examined by demographic factors, illness and healthcare experiences and attitudinal factors.
This section of the report will summarise and draw conclusions from the substantive findings outlined in the results section. This study achieved a very satisfactory response rate (65%), therefore the findings discussed below can be considered quite generalisable to the Irish population.

4.2 Background

The majority of participants had completed some or all of secondary school and most reported that religious or spiritual beliefs were important to them. In relation to illness and healthcare experiences, the majority considered their health to be good. Less than one quarter reported that they or a family member had a genetic condition. A greater proportion reported experience of a blood test than of a tissue test, with women and older participants more likely to report both. Eighty-one per cent reported having been a hospital in-patient at some time in the past with the majority satisfied with the care they received when in hospital. Over one quarter reported that a post-mortem had been carried out on a deceased family member. The majority of these were believed to be hospital requested post-mortems.

Just over one third reported donating blood, 7% reported prior research participation and almost three quarters indicated that they would be willing to donate organs for transplantation after death. Attitudes to medical research were very positive. However, attitudes to genetic research were less positive, with 42% ibelieving that genetic research is tampering with nature. Participants also held positive attitudes to medical researchers and generally felt confident in the ability of various health authorities to assess the benefits and risks involved in medical research. Highest levels of confidence were found for individual doctors and nurses, followed by hospital/university researchers.

4.3 Willingness to donate excess surgical tissue for research purposes

The majority of participants reported that they would be willing to allow their excess surgical tissue be used for medical research. This finding is consistent with previous studies of public willingness to contribute tissue samples for research (Lindblad et al submitted for publication; Hoyer et al 2004; McQuillan et al 2003). Only 5% of participants reported that their willingness would depend on the type of tissue involved. This finding is in contrast to a recent UK study, where willingness to donate

tissue varied depending on the tissue type (Goodson & Vernon, 2004). The UK study also found that a greater proportion of participants were unwilling to donate any tissue for research. Goodson and Vernon speculated that this may be an artifact of recent negative publicity surrounding the organ retention controversy, and reports of medical malpractice in the UK. The present study addressed this question, by examining whether the organ retention controversy influenced public willingness to contribute excess surgical tissue for research purposes in Ireland. Various aspects of this controversy were found to be significantly related to willingness to allow use of excess surgical tissue, but *only* at a univariate level of analysis. Participants who reported being aware of the organ retention controversy and believing that it was due to a lack of safeguards *in the past* and thus unlikely to happen in the future, were significantly more likely to be willing to allow use of their tissue. Similarly, those who reported that their confidence in medical professionals and authorities had not been reduced because of the controversy were more likely to be willing to allow use of their tissue. However, it is important to note that when a multivariate analysis was conducted, these factors did not remain significant. Therefore the speculation of Goodson & Vernon (2004) that the organ retention controversy would be associated with low levels of willingness to donate tissue for medical research was not supported in an Irish context.

Findings from the multivariate analysis showed that willingness to allow use of excess surgical tissue for research was most likely among those with higher levels of education, those with children and those who reported being willing to donate their own organs for transplantation after death. Participants with more positive attitudes toward medical and genetic research were also more likely to report being willing to allow use of their excess tissue as were those who felt that researchers are generally motivated by altruistic reasons. Furthermore, those participants who were aware of tissue storage and who felt motivated by a sense of duty for the potential benefit to future patients were more likely to allow use of their excess tissue,

The finding that willingness to allow use of tissue is higher among those with more altruistic tendencies (i.e. willingness to donate organs) is consistent with the finding that those willing to donate their tissue reported being motivated by a sense of duty as a citizen for the potential benefits there may be for future patients.

It is important to note that the high level of willingness to allow use of excess surgical tissue may be subject to social desirability effects, as participants may feel reluctant to report being unwilling to allow use of their tissue. This study may be further limited by the fact that willingness to allow use of surgical tissue was based on a hypothetical scenario, as findings may not reflect one's decision in 'real life'. However, as mentioned previously, research with patients has also found high levels of willingness to allow use of excess surgical tissue (Jack and Womack, 2003; Malone et al 2002; Start et al 1996).

Similar to previous studies, participants indicated a greater willingness to allow the use of their own excess surgical tissue than to allow the use of tissue taken from a deceased family member following a post-mortem. Whether, this discrepancy is due to the fact that the public view research using tissue from living people as fundamentally different from using tissue from dead people as proposed by Jack and Womack (2003) or whether it is due to reticence in acting without a clear understanding of the deceased's wishes regarding use of their tissue, is unknown. Further research needs to be conducted to determine perceived differences in using tissue from the living and from the dead.

4.3.1 Preferences for linked or unlinked storage

Of those who were willing to allow excess surgical tissue to be stored for future research, half supported storage under a linked ('patient identifiable') model and almost one quarter preferred an unlinked model. However, as it was not known if the public fully understood the value of linked storage, the value of linked storage was highlighted to those who reported being unsure or who indicated a preference for unlinked storage. The provision of such information resulted in an increase in preferences for linked storage, with 89% of participants overall indicating that they were willing to allow excess surgical tissue to be stored under a linked model.

This finding may indicate that when members of the public are unsure about choices, they support the more conservative option. However, when they are informed of the potential benefits of an option, they are willing to change their views. In this context it highlights the importance of an informed public who can make decisions when situations such as requests for participation in research arise. Again this change in preference for linked storage is consistent with the finding that willingness to allow use of surgical tissue is motivated by potential benefits for future patients, including family members. It should be noted that in this study, due to interview time constraints, only the possible value of linked storage was emphasized. This advances on previous international studies where no such clarifications were made.

It is equally plausible that some participants were not aware of the potential risks of linked tissue storage and that alerting those who initially agreed to linked storage to these risks might reduce their willingness to donate in this way. Therefore it is recommended that future studies, provide the public with a balanced account of the potential benefits and risks of linked storage, followed by a re-evaluation of their personal storage preference, after they have conducted their own cost-benefit analysis.

4.3.2 Desire for feedback

The appropriateness of providing research participants who consent to the storage and use of their tissue with research results has been widely debated. Beskow et al (2001) and Savulescu et al (2002) argued that participants should be given the option of whether they would like to be informed about general results from studies using their samples. There is increasing international support for this as part of a larger move to more transparent and egalitarian relationships between professionals and the public.

The majority (69%) of participants in the current study reported that they would like such information. A greater proportion (83%) indicated that they would like to receive information regarding their own risk for a genetic or inherited condition. This figure reduced slightly to 71% in relation to information regarding risk for a condition that is not preventable or treatable.

These findings suggest that the public consider it appropriate to provide feedback to research participants when a study uses their tissue sample, even if feedback included information regarding a genetic or inherited condition that is neither preventable nor treatable. This is in contrast to other studies, which found a reduced desire for information regarding a disease that cannot be treated or prevented (Hoeyer et al 2004; Lindblad et al submitted for publication).

Univariate analysis found that participants who indicated a preference for feedback regarding their risk of a genetic disease were significantly more likely to be willing to allow use of their excess tissue. However, this failed to remain independently significant when adjusting for co-variates in the multivariate statistical analysis. Therefore, while the public seems to consider feedback of research results as important, willingness to allow use of excess surgical tissue was not determined by a desire for feedback regarding one's risk of genetic disease. This finding is consistent with previous research which showed that failure to provide personal feedback did not influence participant willingness to donate tissue to research (McQuillan et al 2003)

It is unknown whether participants understood the complexity of providing research results, particularly the issue of clinical validity of results and the potential for false-positive or false-negative information to participants (i.e. tests inaccurately confirming or disconfirming a diagnosis). It may be beneficial to conduct further studies to determine whether the public, once informed of the complexity of validating research results, would continue to indicate a strong desire for research results.

4.4 Consent preferences

The on-going debate regarding use of archived tissue samples for research focuses on the issue of informed consent. As mentioned earlier, the necessity to obtain specific consent for use of archived samples is widely contested. Yet little is known regarding consent preferences of the public. Such information is imperative as the public represent potential future donors. Furthermore it allows policy makers to make more informed decisions. The present study found that almost half (44%) indicated a preference for general consent, with 36% supporting specific consent and a further 16% indicating a personal choice for either general or specific consent when donating tissue as optimal. Those who supported personal choice also reported their own personal preference. Taking this sub-group's preferences into account, overall 51% supported general consent and 43% supported specific consent. This finding is consistent with previous research which highlights that the public are not strongly in favour of one method of consent over the other (Asai et al 2002; MRC and Wellcome Trust 2001; Ring and Lindblad, 2003). The multivariate analysis found that younger participants (aged 18-34 years) were more likely to support specific consent, whereas older participants were more likely to support general consent. Those who reported poorer health and having had experience of a blood test were also more likely to indicate a preference for general consent. This is consistent with older adults' support for general consent as older participants were more likely to indicate poorer health and experience of a blood test. General consent was also significantly related to being willing to allow use of excess surgical tissue and positive attitudes towards medical and genetic research. *[Hannah to comment of possibility of age cohort effect or potential generational effects*]

Consent preferences were also related to attitudes to the organ retention controversy, such that those participants who felt that such events were a thing of the past and/or unlikely to happen again due to sufficient safeguards, were also more likely to support general consent. It is interesting to note that those participants with more illness or healthcare experience (i.e. reporting having poor health and having had experience of a blood test) indicated a preference for general consent. It is possible that such participants can identify more readily with the hypothetical situation based on their prior experiences of giving blood or being ill. This is consistent with research findings based in real (rather than hypothetical) donation situations where high levels of support for general consent have been found (Stegmayr and Asplund, 2002; McQuillian et al 2003).

Attitudes towards the use of archived tissue samples when a donor is non-contactable were also examined. Fifty-five per cent of participants considered it acceptable to use such tissue samples, provided each new study was approved by a research ethics committee. Almost one third (31%) considered it unacceptable and 14% were unsure. Participants who supported the use of such archived tissue were also more likely to be willing to contribute their own excess surgical tissue for research purposes and tended to support the idea of general consent as opposed to specific consent for use of archived tissue.

4.5 Organ retention controversy

Participants were generally quite engaged in this controversy with over 90% indicating that they had heard of it and had read newspaper articles or listened to radio reports. However, just over half reported discussing this issue with others and 44% reported having heard of the Dunne Inquiry. Only five percent of participants indicated that they were personally involved, such that they knew of specific cases where organs had been retained without permission.

Almost half the sample (46%) expressed a concern that organs may be retained in the future without permission, because of a perceived lack of safeguards. In contrast, one third felt that there are enough safeguards in place to prevent re-occurrence. Similarly, half (51%) believed that doctors failed to ask families for permission because they did not want the added trouble of having to ask the family, whereas 24% believed failure to ask was due to a desire to prevent causing further distress to the grieving family. It is interesting to note, that even though 51% believed doctors failed to ask permission because they did not want the trouble of doing so, less than one third reported that they had lost confidence in pathologists (29%) or hospital doctors in general (25%). This is in contrast to UK speculation that public confidence in doctors, particularly pathologists, has been badly damaged as a result of the controversy (Burton and Wells, 2002; Retained Organs Commission, 2002). Furthermore, public support for the process of post-mortems was found to be relatively high, with over two-thirds indicating that they would consent to a hospital request to conduct a post-mortem on a deceased family member. However, confidence in the Department of Health and Children and managers at hospitals was most affected by the scandal.

The way in which organs were disposed of without asking the family's wishes and the fact that most cases involved children and babies were considered the most problematic features of this scandal. Similarly, the lack of hospital policies regarding retention of organs post-mortem and failure to ask the family for permission to remove organs were considered problematic. However, less than half (42%) of the members of the public surveyed favoured financial compensation for the distress caused to families involved.

4.6 Conclusions and recommendations

Many of those interviewed had engaged with the healthcare system and reported various healthcare experiences such as blood tests, tissue tests and being a hospital in-patient. Participants were generally quite supportive of medical research, with high levels of willingness to contribute excess surgical tissue for research and storage. Similarly, the majority would consent to a post-mortem of a family member. These findings suggest that the public is generally aware of and committed to making a contribution to research and related activities in the healthcare system for their benefit and for the benefit of future patients.

However, the potential for misperceptions regarding various medical processes was repeatedly highlighted throughout the study. The first misperception identified was in relation to an over-estimation of genetic disease among those reporting that they or a family member had a genetic condition, relative to the general population. It is likely that many participants erroneously reported a condition which was in fact a familial but not genetic condition, such as heart disease. This highlights a lack of clarity regarding either the meaning of a genetic or inherited condition or the meaning of words as used by researchers and health professionals compared with the general public. Similarly, the reported ratio of hospital requested to coroner ordered post-mortems, was not consistent with the actual situation, as the majority

of post-mortems in Ireland are ordered by the coroner. As previously mentioned, this misunderstanding may have emerged as coroner ordered post-mortems are generally carried out in a hospital. Thus some participants may have incorrectly believed that staff of the hospital requested the post-mortem. These findings highlight the need to be clear in both research and clinical situations regarding the use of terminology. The challenges to researchers in this area reflect confusion on the part of the public and a need for clearer communication on health issues by all concerned with the public.

Despite a high level of support for organ donation for transplantation, less than half of those wiling to donate organs had signed a donor card or discussed their desire with their family. However, it is unknown whether this was due to a lack of awareness of the value and necessity of such actions or whether the person had intended but had not acted to communicate their preferences. Either way it is important that the public are aware of the value of signing a donor card and discussing their wishes with a family member, should their wish be to have organs donated, as family members are consulted about donation upon the person's death. As demonstrated previously, people are less willing to allow the use of tissue or organs from a deceased relative than they are to allow their own excess surgical tissue to be used. This reluctance may be due to the fact that the person was unaware of the deceased's preferences and so they opt for the more conservative option. Further research is necessary to identify the symbolic differences between tissue from the living and from the dead. Furthermore, publicity to highlight the importance of signing a donor card and discussing organ donation with family members is needed to guarantee that organs are donated as intended by the deceased.

As outlined in the results section, half of those who supported tissue storage would allow their sample to be linked. The remaining participants had no preferences or supported unlinked storage. It was found that highlighting the value of linked storage increased participant willingness to allow tissue to be stored under a linked model. Therefore, it would appear that the public is more conservative in their response when they are not fully informed of the value of a particular process. The obverse may also apply if individuals consider possible risks with linked tissue donation. These findings highlight the need to engage and educate public, so that they can participate in and shape public debate regarding matters of policy and practice in health related research.

The same *modus operandi* may apply to other situations. For example, the majority of participants indicated that they would like personal feedback regarding their genetic predisposition to disease from a study using their tissue samples. The provision of such information may not always be appropriate, as many studies are exploratory in nature and consequently their findings may not be clinically valid. It is unknown, but probably unlikely that many participants were aware of the issue of clinical validity and the need for several replications of a given study, when responding to the question. Given the high level of acceptability of linked storage following information regarding its value, it is likely that the public would accept, the contribution of tissue to research without personalised feedback. However, further research is necessary to determine whether this is the case.

Finally, in relation to preferences for consent procedures, findings were equivocal with similar proportions supporting either general or specific consent. This study thus informs and can help to set an agenda for further communication with the public rather than opting for restrictive legislation, e.g. the option of specific consent only as a 'safe' bet in all circumstances. While the public do not strongly favour one method of tissue donation over the other, informing the public of benefits and weakness of each procedure followed by a re-evaluation of their preferences would guarantee a more informed and representative debate about public preferences which could be used to inform legislation in the Irish context.

These conclusions and recommendations are made in a very fluid context of increasing public awareness of dilemmas in health-related research and in the context of rapidly changing frontiers in healthcare practice. Ongoing information, education and evaluation is needed to enable the dialogue necessary among the widest public audience, professionals and policy makers. This project should be the first of many, using different consultation mechanisms and considering for instance a focus on *contemporary* experiences of healthcare and research rather than a broader and thus more historical coverage of lifetime experience of these issues as was the case in this study. Ultimately, research in the health context is itself a public resource. The public good that can be achieved through research can only develop and prosper through increased dialogue among all of the relevant stakeholders. In sum, we do live in a brave new world- a world where "all the bets are off" in terms of public and professional partnership in science and medical research. We face an era of increasing (and possibly initially uncomfortable) dialogue among many stakeholders- scientists, health professionals, industry, policymakers and most notably the public. We need to embrace that dialogue. The findings of this study provide one heretofore unavailable perspective on contemporary health-related research issues in Ireland – that of the wider general public. It is hoped that it will form the first component of an ongoing dialogue to foster research as a core activity of, and for the greater good of, the Irish and wider general public.

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APPENDIX 1

Basic definitions for interviewers

Human Tissue: Blood, skin, muscle, bone, cellular material etc. that may be removed from the human body to perform medical tests, to treat a condition or for research purposes.

Inherited or Genetic Condition or Illness: Any illness or condition that may be passed down from parents to children. Many illnesses have both a genetic and an environmental component.

A Private Household is an individual or group of people responsible for their own housekeeping. It could be someone living alone or a group of people who live together and share a budget for things like rent, mortgage, heating, electricity, telephone and so on. It could be a family household or a household made up of a group of unrelated people sharing a flat or house.

This is in contrast to an **institution,** such as a hospital, nursing home, prison, boarding school and so on where the residents are not responsible for their own housekeeping. Institutions are not included in the present survey. If the interviewer contacts an institution in the course of telephoning, s/he should simply say that we are seeking to interview only in private households and not proceed with the call. In cases like these, there is no need to explain in detail the nature of the study being conducted.

Genetic Research: The study of the patterns of inheritance of specific traits and the process through which these are inherited.

Biotechnology: The industrial use of living organisms or biological techniques developed through basic research. Biotechnology products include antibiotics, insulin, interferon, recombinant DNA, and techniques such as waste recycling.

Stem Cell: A cell that can replicate indefinitely and which can differentiate into other cells; stem cells serve as a continuous source of new cells. Examples include cells in bone marrow and the testis.

Irish Medicines Board: The fundamental role of the IMB is to protect and enhance public and animal health through the regulation of human and veterinary medical products. Among its many activities, the IMB regulates clinical trials, as well as monitoring and inspecting products on the market to ensure their safety and efficacy.

Health Research Board: The Health Research Board is a statutory body that promotes, funds, commissions and conducts medical, epidemiological and health services research in Ireland. The HRB encourages research that translates into improved diagnosis, understanding, treatment and prevention of disease and improves efficiency and effectiveness of the health services. The HRB works closely with partners in Northern Ireland, the United States and Europe to promote health research on the island of Ireland.