

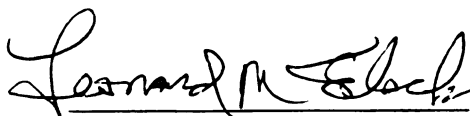
This is to certify that the
thesis entitled
Ethical Issues in Population Genetics: A Study of the Human
Genome Diversity Project and the Issue of Informed Consent

presented by

David Leon Barron Ross

has been accepted towards fulfillment
of the requirements for

Master of Arts degree in Interdisciplinary Program
in Health and Humanities



Major professor

Date 11/20/00

PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.
MAY BE RECALLED with earlier due date if requested.

DATE DUE	DATE DUE	DATE DUE

**ETHICAL ISSUES IN POPULATION GENETICS: A STUDY OF THE HUMAN
GENOME DIVERSITY PROJECT AND THE ISSUE OF INFORMED CONSENT**

By

David Leon Barron Ross

A THESIS

Submitted to

Michigan State University

In partial fulfillment of the requirements for the degree of

MASTER OF ARTS

Interdisciplinary Program in Health and Humanities

2000

ABSTRACT

ETHICAL ISSUES IN POPULATION GENETICS: A STUDY OF THE HUMAN GENOME DIVERSITY PROJECT AND THE ISSUE OF INFORMED CONSENT

By

David Leon Barron Ross

The Human Genome Diversity Project (HGDP) is an international effort to collect DNA samples from human populations around the world. The goal of the HGDP is to facilitate studies in population genetics, which ultimately could lead to a better understanding of human evolution, population-specific genetic markers, and inherited resistance and susceptibility to disease. Throughout the project's development, many ethical issues have been raised about the collection of biological materials from indigenous populations. Critics of the HGDP argue that proper informed-consent standards will not be followed, that participating communities will be harmed by the research, and that the HGDP will not result in any benefits for those who agree to participate in the research. The purpose of this thesis is to show that it is possible to elicit informed consent from diverse populations while at the same time respecting the cultural identities, customs, and concerns of those populations. It is my aim to show that dynamic communication and respecting the cultural identity of the populations are essential for conducting ethical research and promoting active collaboration in population genetic research.

ACKNOWLEDGMENTS

I would like to thank the following people and organizations for helping me write my masters thesis: my thesis advisor Dr. Leonard Fleck and committee members Dr. Fred Gifford and Dr. Ann Millard. I would also like to thank Dr. Richard Sharp and the National Institutes of Environmental Health Sciences for providing me with a summer internship that allowed me to revise and finish my thesis. Finally, I would like to thank all my friends for helping me work out the thought processes that it took to write my thesis, without them many of the concepts that I wrote about would have never gotten off the ground or stayed airborne.

TABLE OF CONTENTS

Introduction.....	1
The Human Genome Project and Diversity.....	9
The Human Genome Diversity Project.....	11
Anthropological Research Goals of the Human Genome Diversity Project.....	12
Biomedical Research Goals of the Human Genome Diversity Project.....	14
Obtaining DNA Samples.....	16
The Nature of Informed Consent in Human Genetic Research.....	16
Group Consent.....	20
Arguments Against Seeking Group Consent.....	23
Culturally Sensitive Individual Informed Consent.....	26
Group Consultation.....	27
Cultural Cohesion and Identity.....	29
Case Studies.....	31
A Case Study: The Icelandic Genome Database.....	31
Case Study: The Navajo.....	36
Objections and Considerations.....	41
Practicability and Presumed Consent.....	49
Conclusion.....	56
BIBLIOGRAPHY.....	59

Introduction

The Human Genome Project (HGP) is an international effort to sequence and map the entire human genome, which consists of the 3 billion pairs of chemical bases that make up the DNA located inside the nucleus of each of our cells (Cook-Deegan 1994). In 1991 geneticist Luigi Luca Cavalli-Sforza of Stanford, Mary-Claire King and Alan Wilson of the University of California, and others made a passionate plea in an article in the journal *Genomics* for the creation of a complementary project to the HGP that would address the genetic differences and similarities in the various human populations (Cavalli-Sforza 1991). They argued that “indigenous peoples are being absorbed into the larger gene pool at an escalating rate, and if the information contained in their DNA is not collected quickly, it may be lost to humankind forever,” (Gutin 1994). They believed that the “genetic diversity of people now living harbors the clues to the evolution of our species,” (Cavalli-Sforza 1991). Furthermore, they believed that the activity of the HGP did not include a method for a systematic evaluation of genetic variation within the thousands of human populations. Instead the HGP is more a “study in the consensus genome rather than an assessment of naturally occurring variation,” (Gillis 1994).

The authors were given funding from the Human Genome Organization to devise a proposal to collect a wider range of DNA that would reflect the variation present in the genetic diversity of the human gene pool (Gutin 1994). Their effort would eventually become known as the Human Genome Diversity Project (HGDP). The Human Genome Diversity Project is an international project that seeks to understand the diversity and unity of the entire human species. It is an effort by geneticists, anthropologists,

physicians, linguists, and other scholars from around the world designed to collect information on human genome variation (HGDP FAQ 1993, HGDP Summary Document 1993). The research proposed by the Human Genome Diversity Project is exemplified in two main areas of focus, one of them comprising their anthropological research goals, and the other their biomedical research goals.

The anthropological research goals of the HGDP involve studying the history of human migration and evolution by studying human biological history and the biological relationships among different human groups. The biomedical goals of the HGDP involve studying the genetic material of populations who have a unique susceptibility or resistance to a particular disease. Researchers believe that analysis of DNA samples, in conjunction with epidemiological evidence, may help lead to the identification of genetic factors in some diseases and eventually to ways of treating or preventing those diseases (Model Ethical Protocol 1997, Crigger 1995, HGDP FAQ 1993, HGDP Summary Document 1993).

Many ethical issues arise as a result of pursuing a human population genetic study such as the Human Genome Diversity Project. These ethical issues may arise because many of the populations that researchers involved in the project intend to study have been exploited in the past by other Western researchers. It is my intention to analyze some of the major ethical issues involved in human population genetic research with a particular focus on the Human Genome Diversity Project. Specifically, I will explore the ethical issue of determining the proper level of informed consent for the Human Genome Diversity Project. To be more precise, **is it the case that in pursuing human population genetic research, informed consent must necessarily be sought from**

designated population leaders when the traditions of a population dictate that such decisions are made by designated group leaders for the entire population?

Alternatively, are there some circumstances where ‘culturally sensitive individual informed consent’ may be adequate in human population genetic research?

There has perhaps not been a project in the history of the study of population genetics that has been more visible and controversial than the Human Genome Diversity Project. Ever since its conception in 1991, the HGDP has met intense opposition to the project’s quest to collect DNA samples from various world populations in order to study genetic variation. Though the designers of the project believed that their goals were noble and their intentions honorable, there have been many criticisms of the ethics surrounding the HGDP. In 1995 the North American Committee of the Human Genome Diversity Project drafted the Model Ethical Protocol for Collecting DNA Samples to address the ethical criticisms directed towards the project. The Model Ethical Protocol was a way for the project to show that it took the various ethical issues that might arise as a matter of undertaking a global survey of genetic diversity very seriously. The project hoped that by drafting a set of ethical guidelines for researchers to follow in the collection of DNA samples, they could proceed with the project and silence their critics (Model Ethical Protocol 1997).

In 1997, after the Model Ethical Protocol had been reviewed and scrutinized by many researchers in such fields as genetics, anthropology, and law a final version was submitted for publication in the *Houston Law Review* under the title Proposed Model Ethical Protocol for Collecting DNA Samples. It was around this time that the National Research Council’s Committee on Genetic Diversity was formed in order to evaluate the

consensus document for the Human Genome Diversity Project. This multidisciplinary committee was charged by the National Science Foundation and the National Institutes of Health with the task of “assessing the scientific value, technical aspects, and organizational requirements of a systematic worldwide survey of human genetic variability and the ethical, legal, and social issues that would be raised by it before the commitment of substantial funds to any survey,” (National Research Council 1997). The committee held four meetings in order to discuss the ethics of the Human Genome Diversity Project, a task that was more elusive and challenging than the committee had originally envisioned.

It seemed that in the drafting of a consensus document for the Human Genome Diversity Project that there was really little consensus about how the project should proceed in collecting samples. Different participants in the formulation of its consensus document had various perceptions of the intent and organization structure of the HGDP. In the end the National Research Council committee found that there was “no sharply defined proposal that it could evaluate, and as a result, it chose to look at the issues posed by such a global survey of human genetic variation more broadly,” (National Research Council 1997). Perhaps one of the most controversial and ethically challenging aspects of the Human Genome Diversity Project was only briefly mentioned in the National Research Council’s evaluation, that of the necessity of group consent in human population genetic research. According to the committee “current international policy does not address whether a community should be able to veto the voluntary participation of individual members in legitimate research,” (National Research Council 1997). The question being raised is this: If the group has decided not to participate, should individual

volunteers who identify themselves as group members continue to be recruited and enrolled as representatives of the group (National Research Council 1997)?

The National Research Council believes that it is too extreme a position to require both group and individual consent in the collection of DNA samples for the study of genetic variation. They believed that as long as the participants understood “both the objections of their community and the rationale for them as part of the informed consent process, individual consent is the proper degree of consent required for population genetic research,” (National Research Council 1997). This recommendation is in stark contrast to that of the policy proposed by the Human Genome Diversity Project in its *Model Ethical Protocol for Collecting DNA Samples*. In the protocol the HGDP states that in addition to individual informed consent it believed a further consent process was required in order to proceed with the collection of genetic material from populations. The project states:

“The HGDP intends to study populations, not individuals. As a result, we believe that both the populations and the individuals must give their free consent to participate. This is particularly true because the effort to include samples from throughout the human species means that many of the populations will not be part of the industrialized world, where genetic studies to date have concentrated. Many of the populations that might participate in the Project are politically or economically marginal in their countries. They have faced discrimination, oppression, and even genocide. Under such circumstances, it cannot be ethically appropriate to sample some members of a group when the group itself has not agreed to

participate in the Project. Such methods would themselves be another form of attack on the autonomy of the population,” (Model Ethical Protocol 1997).

Based on this statement the HGDP believes that any population-based research would therefore require what they call population-based or group consent. They further state:

“Specifically then, the HGDP requires that researchers participating in the Project show that they have obtained the informed consent of the population through its culturally appropriate authorities where such authorities exist, before they begin sampling. If for example, the Navajo nation decided that it would not participate in the Project, the Project would not accept samples taken from members of that population. Some may argue that this violated the rights of an individual who wants to participate, even if their group organization does not. We believe, however, that the population-based nature of this research requires population-based consent and we will insist on it,” (Model Ethical Protocol 1997).

The HGDP characterizes the populations that they wish to study as groups that “exhibit unique cultural or linguistic attributes,” whose genetic and cultural identities are in danger of being lost or destroyed (HGDP Summary Document 1993). Many of the populations that the HGDP researchers wish to study are located in the non-Western

world; their cultural identity and moral philosophy are often different than ours. In the cultural and moral philosophy of Western society individual autonomy in decision-making is a right that is sought to be protected, as is evident in the informed consent procedure of most medical research. Before any research can be conducted, researchers must show that they have solicited informed consent from each participant in the study. It may be the case in population genetic research that seeking solely this level of individual consent may be a foreign concept that is inadequate to address the cultural identity and concerns of many non-Western populations. The concept of rights, such as individual autonomy in decision-making, that in the Western world is viewed as a necessary part of informed consent in genetic research, is not a worldwide concept.

It is true that in many non-Western societies the individual identity of population members is directly tied with the population's identity. Their cultural identity, like their genetic makeup, is homogeneous to a level of unity that extends beyond the concept of individual autonomy. Group consent, or *extending the decision-making authority to the designated leaders empowered to speak on behalf of the population*, is a concept that is more prevalent in many of these non-Western societies. It is because of the existence of this group identity that many researchers involved in population genetic research believe that group consent is the proper method for granting inclusion into a study.

In his book, *Harmless Wrongdoing*, Joel Feinberg outlines what he believes to be some of the concerns that might arise in addressing the issue of autonomy and community. He states "whatever else a human being is by nature, he is essentially a social product. He is born into a family, itself a part of a tribe or clan and a larger political community, each with its ongoing record of history," (Feinberg 1990). It would

be absurd then, he argues, to think of an individual as independent of his socialization in a particular social group. A social group is made up of a collection of individuals that are sometimes, but not always, defined by their group based on their status within the group. Values such as tradition, cultural identity, and faith run deep amongst individual members who have been forged together as a community (Feinberg 1990). It could therefore be argued that in population genetic research involving groups with such cultural cohesion that seeking group consent is the only way to respect this organizational structure.

The rest of this thesis will be dedicated to exploring the issue of group consent in human population genetic research with a focus on the Human Genome Diversity Project. **It is my intent to show that in most cases when it comes to seeking consent for participation in population genetic research the appropriate form of consent is culturally sensitive individual informed consent. Furthermore, it is only in cases where the traditions of a population dictate that such decisions are made by designated group leaders for the entire population that group consent should be sought.**

The Human Genome Project and Diversity

The Human Genome Project (HGP) is an international effort to sequence and map the entire human genome, which consists of the 3 billion pairs of chemical bases that make up the DNA located inside the nucleus of each of our cells (Cook-Deegan 1994). Sequencing the genome will involve finding the consecutive order of these chemical bases; (designated by the letters A, C, T, and G), and then writing them out as one giant 'genome blueprint'. In 1990 the Project was officially launched in the United States, funded largely by the National Institutes of Health (NIH) and the Department of Energy (DOE) (Hood 1997, Marks 1995, Kevles 1992, Lowenstein 1992). The human genome, once deciphered, is expected to be the ultimate sourcebook for understanding human biology and inherited diseases such as cystic fibrosis, Huntington's disease, and certain types of cancer.

In terms of human genome and genetic diversity, on average two people of the same sex differ in their genome by only .1%, meaning that they would be 99.9% identical if you were to compare their genetic material (Lowenstein 1992). Though that number seems quite small, there are about 3 billion base pairs in human DNA, which means that .1% would sequence for 3 million base pairs. These variations within the human population, called polymorphisms, "are rather enough genetic difference to account for the individual and racial variability that we observe among the human species," (Greely 1998, Lowenstein 1992). It is also estimated that approximately 6000 of these polymorphic markers are spread evenly across the human chromosome. "A polymorphic marker is, typically, a genetic variant on an individual chromosome where a single DNA

letter or small group of letters varies among members of the human population with a frequency greater than 1%. A human genetic map could then be used to identify genes that may predispose to disease,” (Hood 1997).

In 1991 geneticist Luigi Luca Cavalli-Sforza of Stanford, Mary-Claire King and Alan Wilson of the University of California, and others made a passionate plea to the researchers involved with the HGP in an article in the journal *Genomics* to address these genetic differences and similarities in the human population (Cavalli-Sforza 1991). They argued that “indigenous peoples are being absorbed into the larger gene pool at an escalating rate, and if the information contained in their DNA is not collected quickly, it may be lost to humankind forever,” (Gutin 1994). “The genetic diversity of people now living harbors the clues to the evolution of our species,” (Cavalli-Sforza 1991). Furthermore, they believed that the activity of the HGP did not include a method for a systematic evaluation of genetic variation within the thousands of human populations. Instead the HGP is more a “study in the consensus genome rather than an assessment of naturally occurring variation,” (Gillis 1994, Marks 1995).

According to Cavalli-Sforza and his group, there was a need to preserve a record of our genetic heritage that was not being represented by the strictly Caucasian genome of the HGP. The Human Genome Organization, a privately funded council by the Howard Hughes Medical Institute and the Imperial Cancer Research Fund that was organized to coordinate human genome research internationally and to foster exchange of data, materials, and technologies, heard their plea (Kevles 1992). Subsequently, they received funding not only from the Human Genome Organization, but also from agencies including the National Institutes of Health, the Department of Energy, and the National

Science Foundation. The authors were given seed money in order to devise a proposal to collect a wider range of DNA that would reflect the range of variation produced by the extensive genetic diversity of the gene pool. Their effort would eventually become the Human Genome Diversity Project (HGDP).

The Human Genome Diversity Project

The Human Genome Diversity Project is an international project that seeks to understand the diversity and unity of the entire human species. It is an effort by anthropologists, geneticists, physicians, linguists and other scholars from around the world designed to collect information on human genome variation (Knoppers 1996, HGDP FAQ 1993, HGDP Summary Document 1993). Their aim is to investigate the variation occurring in the human genome by “studying samples collected from populations that are representative of all of the world’s peoples and to create a resource for the benefit for all of humanity and for the scientific community worldwide,” (Model Ethical Protocol 1997). The resource will exist as a collection of biological samples that represents the genetic variation in human populations worldwide and also as an open long-term, genetic and statistical database on variation in the human species that will accumulate as the biological samples are studied (HGDP Summary Document 1993).

The project expects that the samples will be preserved in repositories around the world, where they will be made available to all qualified researchers. By collecting the same set of multiple genetic markers across many populations, the projects organizers hope that researchers studying the data will be able to confirm hypotheses about a range of topics (Gillis 1994). These topics are exemplified in two main research areas of the

HGDP, one of which I shall call their anthropological research goals, and the other their biomedical research goals.

Anthropological Research Goals of the Human Genome Diversity Project

The anthropological research goals of the HGDP involve studying the history of human migration and evolution by examining human biological history and the biological relationships among different human groups. It is the opinion of the HGDP that human groups seem to be interested in their origins and that many may be interested in scientific evidence about those origins. According to the project, “The frequencies of different variations in different populations can reveal how recently they shared a large pool of common ancestors. Those frequencies can be used to see if, for example, the Irish are more closely related to the Spaniards or Swedes,” (HGDP FAQ 1993). The project also believes that this information might also help clarify the history of the major human migrations. It could tell us where people came from, what geographical routes may have taken them to their present location, and how they interacted socially within their populations and with other populations over the course of history. “It can help tell us, for example, whether different migrations brought Native Americans to the Western Hemisphere from Asia or whether a single group is ancestral to all modern Native Americans,” (HGDP FAQ 1993).

The term ‘population’ has many meanings; it is most often used to “*designate a body of persons (or other organisms) that have a common quality or characteristic, to designate a group of interbreeding organisms, or to designate a group that occupies a specific geographic locale,*” (National Research Council 1997). From an anthropological

standpoint, if language were used as a major criterion, there would be over 5000 distinct human populations in the world that have distinctive linguistic properties and possibly distinct gene frequencies (National Research Council 1997, Knoppers 1996, Gillis 1994, HGDP Summary Document 1993). Some of the things that might make a population of particular interest from a biological standpoint include an unusual language, culture, or history. The planners of the HGDP recognize that any method of selection will be imperfect and apt to generate controversy. Accordingly, they have focused their recommendations on the types of populations to be included (based on language or cultural considerations in the anthropological case and unique genetic susceptibility or resistance in the biomedical case) in the survey rather than on the identification of specific human groups to be sampled (National Research Council 1997, HGDP Summary Document 1993).

Consequently, it is not an effort to collect samples from just isolated populations in danger of disappearing, but all human populations including those in Europe and North America. Without the efforts of the HGDP, researchers involved believe that some human groups may cease to exist as discrete populations, usually through urbanization or other forces leading to the loss of their language or other characteristics that identify them as a separate group. According to one HGDP study group of the roughly 5000 languages in the world, 90% are expected to be lost or doomed to extinction by the end of the 21st century (Gillis 1994). Genetically distinct populations could disappear, some by physical extinction, but most by admixture with other groups. For example, organizers have considered studying small Amazonian tribes whose ways are quickly disappearing like the Yoruba of Africa, and various European communities who have lived in relative

genetic and linguistic isolation from their nearest neighbors such as the Basque population of northern Spain and Southern France (Gillis 1994, HGDP FAQ 1993).

As far as scientists know, however, no particular gene makes a person Irish or Chinese or Navajo; these are cultural labels. While people in these populations are more likely to have some genetic markers in common, no marker will be found in all members of one population and in no members of another. One of the loftier assumptions of the HGDP researchers is that the Diversity Project might somehow confirm and support what they believe is already clear from population studies, namely that in biological terms, there is no such thing as a clearly defined race. By leading to a greater understanding of the nature of differences between individuals and between populations, the HGDP hopes to combat the widespread popular fear and ignorance of human genetics and will make significant contributions to the elimination of racism (HGDP Summary Document 1993). "After the Diversity Project", predicts planning committee member Georgia Dunston of Howard University, "we won't have the luxury of drawing distinctions between one another based on skin pigmentation anymore," (Gutin 1994). Others contend that the HGDP is "likely to add fuel to popular notions of race and genetically determined differences, simply shifting the folk concept from phenotype to genotype," (Crigger 1995).

Biomedical Research Goals of the Human Genome Diversity Project

The biomedical goals of the HGDP involve studying populations that have a unique susceptibility or resistance to a particular disease. The HGDP states, "People vary in their susceptibility to different diseases, and while much of the explanation will be due

to environmental factors like diet, climate, and parasites, genetic predisposition plays a role in many cases,” (HGDP Summary Document 1993). Researchers believe that the analysis of DNA samples, in conjunction with epidemiological evidence, may help lead to the identification of genetic factors in some diseases and eventually a way to treat or prevent those diseases (Crigger 1995, HGDP FAQ 1993, HGDP Summary Document 1993). Just as language is one of the primary criteria in the anthropological aspect, differences in the distribution of gene marker frequencies provides a scientifically objective basis for defining human populations from a biological point of view.

Some DNA bases and sequences can differ from person to person without changing anything; in other words, they don't seem to have any effect on how the body functions. Other variants produce such effects as variation in height, eye color, and blood groups. Sometimes, particular genetic variants can lead to susceptibility to disease or to an unusual resistance to disease. For example, indigenous peoples do not suffer from the same diseases in the same ratios, as do Northern Europeans. This is partly a result of environmental differences, but is also due to genetic differences, which cause interactions with environment leading to various health outcomes. Although the incidence of heart disease, hypertension, and diabetes is high amongst Australian Aboriginal peoples, the incidence of some types of cancer is relatively low (Dodson 1999). African Americans, as another example, experience higher failure rates in organ transplants, partly because donors and recipients, even if both are of African origin, may have geographically different ancestries. If geneticists understood DNA variation on the African continent, tissue matching could be done more effectively (Gutin 1993).

Obtaining DNA Samples

The planners of the HGDP do not specify a simple sampling strategy to obtain the samples, but rather will depend on the primary scientific question that has motivated the inclusion of that population in the project, whether it is the anthropological or biomedical criterion. In general, as many individuals as possible would be sampled in each population, but in many cases 25 individual DNA samples may be sufficient to provide an adequate number of genetic markers to be evaluated (HGDP Summary Document 1993, National Research Council 1997). These DNA samples can be taken from small blood samples, hair roots, from sputum, or from cells scraped off the inside of the cheek. The project will preserve these samples in both central and regional repositories around the world. Most of the samples will be frozen; some of the blood samples will be changed into cell lines, which are capable of producing large amount of duplicate DNA for study. Once the samples have been analyzed, they will be placed into a computerized database. According to the designers of the HGDP information in the databases will then be broadly available to those who want to use the results for legitimate research (National Research Council 1997, Modern Ethical Protocol 1997, HGDP Summary Document 1993). It is here in the protocol for collecting and maintaining the genetic material where many of the ethical challenges arise in the Human Genome Diversity Project. One of the most challenging and debated issues in population genetic research is determining what should be the proper level of consent required for obtaining informed consent from individuals and populations.

The Nature of Informed Consent in Human Genetic Research

According to the organizers of the Human Genome Diversity Project, truly informed consent is both the greatest protection against exploitation of sampled populations and the strongest way to demonstrate respect for its culture. The Council of International Organizations for Medical Sciences (CIOMS) believes that “consent is informed when it is given by a person who understands the purpose and nature of the study, what participation in the study requires a person to do and to risk, and what benefits are intended to result from the study,” (Model Ethical Protocol 1997, Evans 1996). Informed consent is intended to provide the subject with knowledge needed to make a rational choice and to remind the investigator(s) of their ethical duty to apprise the subject(s) of dangers in the project even though they may be subtle or remote (Reilly 1998, Clayton 1995). In terms of the protocol of the HGDP, ethical issues in informed consent arise as a matter of the information provided to individuals and populations before samples are to be collected.

In any form of human research, consent of the individual participant is required by the Nuremberg Principles, the Helsinki Declaration, the CIOMS, and U.S law. This consent requires a full discussion of the methods, goals, risk, and benefits of the proposed project (Model Ethical Protocol 1997, American Society of Human Genetics 1996, Knoppers 1996). Ideally in order to keep individuals and populations constantly informed about the nature of the project and changing goals in research, researchers involved in collecting samples for the HGDP believe that they should be closely connected with the populations that provide samples. Bioethics literature on informed consent is extensive, but it has been argued that few researchers have been able to explore

the issue of informed consent from a culturally sensitive perspective (Marshall 1996, Gostin 1995, Caplan 1994, King 1992).

Since the HGDP intends to collect samples from populations from all over the world they expect to involve people who are knowledgeable about both the science behind the project and the culture of the sampled populations. Sampling must be planned and prepared well in advance of seeking informed consent. Researchers must first learn about the customs and cultures of the populations before they can seek consent for participation. Consultation with 'experts' involved with these populations will be essential. In some cases those experts will be members of the population who have the knowledge and skill to permit them to evaluate and explain the project. In other cases, they will be outsiders who have a unique understanding of the population, often anthropologists and linguists, who have spent an extended period with the people learning their language, customs, and culture. These knowledgeable people can act as "cultural interpreters, translating the lifeways, goals, and hopes of each for the other to help insure that the population and the Diversity Project understand each other," (HGDP FAQ 1993).

The researchers of the HGDP intend to relay as much information as they can to the individuals and populations about the nature, goals, and methods associated with involvement in the project. The project believes first and foremost that participants should be informed that the HGDP is a collaborative scientific project designed to collect samples from people all over the world to add to samples already being analyzed. They should further be informed that samples will mainly be used to trace human history and to help understand the nature of some diseases, but also it should be made clear the samples may be used for a variety of different projects in the future. However, in cases where the

project would like to use the samples for projects not mentioned in the informed consent process, they would have to go back and ask for consent from the participants. It is considered inappropriate to ask a subject to grant “blanket consent” for all future unspecified genetic research projects.

The participating population would not only then have the right to consent to its participation in the project, but could also control how its materials and information are to be used. During the process of seeking informed consent the participants would be given the opportunity to limit or condition the uses of the genetic material they contributed and information derived from them. The participant’s choices would be documented as part of the informed consent process, and then samples would only be released to researchers who have been bound by contract to abide by the limitations set by each participating member (Greely 1998).

Finally, a crucial part of truly informed consent involves being honest and forthright about the possible benefits of the research. In terms of informed consent the HGDP believes that researchers should refrain from overstating or overpromising the goals of their research. Although the project seeks to make advances in knowledge about genetic susceptibility and resistance to disease, it is not guaranteed that every endeavor will lead to a “scientific breakthrough”. Therefore, saying to a possible participant that providing a DNA sample will lead to a vaccine or a cure may be possible, but never a guarantee. Instead participants should be informed that participation may lead to better understanding of the genetic components of disease, and that better understanding may lead to better treatment options in the future (Model Ethical Protocol 1997, American Society of Human Genetics 1996, HGDP Summary Document 1993). Now that there is a

clear understanding of the issues involved in informed consent, the next section will examine the arguments for and against group consent in human population genetic research.

Group Consent

According to the HGDP planning committee, ultimately each population will decide whether it wants to participate in the project. Researchers need to find out whether or not the population is interested in participating before they become committed to sampling individual members for genetic material. Researchers involved in the HGDP intend to seek informed consent from the population on two levels, individual informed consent and population-based, or what is commonly referred to as 'group consent'. The term "population-based" is often broadly defined to include *all research and practice performed on, or which affects, groups of people or populations*. This can entail, as it does in the HGDP, large scale collection, storage, transfer and use of sensitive health care, demographic, social and behavioral data (Gostin 1991). The HGDP qualifies its commitment to group consent by arguing that a researcher must move beyond the immediate community and seek consent from the culturally appropriate authorities that the group respects in making health care decisions (Juengst 1998a, Model Ethical Protocol 1997).

In recent articles and discussions, there have been three methods of seeking informed consent suggested for collecting genetic material for human population genetic research. At one end are those who argue that only groups who collectively volunteer themselves as participants to a study in response to an open invitation should be

considered as future collaborators in the research. At the other end are those who recommend preliminary consultation with targeted populations to determine how best to secure culturally appropriate informed consent from individual members. Somewhere in between these two arguments are those who argue that a group, once selected for genomic study, should be given the opportunity to decline participation on behalf of their members by being asked in advance for permission from their culturally recognized leaders (Juengst 1998a). The last method is consistent with the method of consent sought by the HGDP as written in the Model Ethical Protocol for Collecting DNA samples.

Group consent, many argue, is the best way to protect an individual participant and their population from stigmatization and discrimination as a result of the information learned from the HGDP's research. Those who are in favor of group consent argue that human groups have a stake in the outcome of human genetic research, hence the decision to participate in such research should be subject to group permission. Many of the populations that the HGDP seeks to participate in the project often tend to identify themselves through the populations to which they belong, rather than as isolated autonomous individuals. They largely accept their group's values and priorities as their own and an individual's purely private interest will be congruent with the group's interest in genetic research.

It is further argued that it is only through their group identity that the harms of population genetic research, such as stigmatization and discrimination, can be realized (Foster 1999, Juengst 1998a, Foster 1997). The association of a group with a "genetic predisposition" to a disease illustrates how genetic research can present collective risks to all members of a socially identified group (Foster 2000). The whole group, not just the

individual participants, must endure the possible harmful results of research done that is population-specific. Therefore, many argue, a decision to undertake shared risks is most properly made at the level of the group through its culturally respected leaders who make health care decisions.

It may also be the case that, in some cultures, the very concept of respect for persons as individuals may be at variance with more relational definitions of the person found in other societies (Foster 1999, Knoppers 1996, Gostin 1995, Gostin 1991). In these societies which stress the embeddedness of the individual within the society, their relations to the group as an entire entity define individual persons. In effect, asking subjects to make individual choices about collective issues requires them to disregard their affiliation with their primary cultural communities. A research study that bypasses a population's established "collective decision making process" by relying on individual informed consent, Foster argues, "places the moral authority of the larger community at risk," (Foster 1999). "Collective harms do not disappear just because some individuals who share a community's concern do not recognize those harms," (Foster 1999). Genuine respect for human dignity requires deeper understanding of the participant's values, culture, and community (Gostin 1995).

Finally, it is argued that it is an individual's membership in socially constructed groupings, not their genetic membership in questionable demic families, that gives a person their connections, origin stories, and identities (Juengst 1998a, Moore 1996). Anthropologist John Moore argues "Within most indigenous epistemologies the question of origins, the understanding of a peoples past, and early relations to other groups are dealt with in a very different way than the scientific way. Those communities already

know where they came from, who they are and what their relationships to the land are,” (Juengst 1998b). Furthermore, in contrast to the beliefs of researchers involved in anthropological population genetic studies, these populations might not be interested in the scientific explanation of their origins. A group’s origin stories and its understanding of its relation with its neighbors are basic foundations for the values and beliefs that are held in high esteem. Genetic information could be used in effect to “retell” a population’s history, therefore undermining its ability to assert their cultural identity. This is one reason that researchers argue that it is important to allow groups to identify themselves rather than try to use the labels that others may give them. To allow individuals to “self report” their ethnicity is to honor their own understanding of their social group membership and the meaning that it provides for their lives (Foster 1999, Juengst 1998b).

Arguments Against Seeking Group Consent

The idea of seeking group consent in human population genetic research is not persuasive to all philosophers and researchers. There is a great deal of literature criticizing the use of group or “community consent” in human population genetics. While the Human Genome Diversity Project believes that the “population-based nature of this research requires population-based consent,” others such as Eric Juengst and Philip Reilly have called it “morally hazardous”, “paternalistic”, “inherently demeaning”, and “too extreme” (Juengst 1998a, Reilly 1998). The question being debated is whether or not study populations should have the right to veto proposed research involving their members.

In seeking group consent from participating populations, HGDP researchers hope to minimize stigmatization and discrimination that may result from their studies. However, there are some that argue that it may be problematic, if not impossible to grant such protection by including a process of group consent in human population genetic research. It may be the case that the definition of what it means to be a 'human group' that would have the decision-making authority in genetic research is not entirely clear. In his paper, "Groups as Gatekeepers to Genomic Research", Eric Juengst argues that our understanding of what it means to be a 'population' might affect how we view the role of group consent in genetic research (Juengst 1998a).

Juengst argues that for the last 60 years population researchers have defined groups of individuals that are more genetically similar to each other than to any other individuals as 'demes'. The human groups that are chosen and compared in human population genetic research are not self-identified groups, but rather members of genetically similar demes. Essentially, it is not the social group that is the target of a population genetic study, such as the HGDP, but rather their biological relationship to each other and their genetic differences to other populations. These demes would, in many cases, display 'little resemblance to a map of the world's self-identified autonomous human groups that are empowered to speak on behalf of their members," (Juengst 1998a). Juengst believes that it would be dangerous to grant these genetically linked populations a special social identity.

If, on the other hand, we try to devise a system in which we allow self-identified, morally authoritative social groups to be proxies for genetic research, this could also be morally problematic. Juengst argues "by constructing demes against the boundaries of

real social groups and then reinterpreting those boundaries in terms of the demic results, genomic research relocates the group's reality to the genetic level," (Juengst 1998a). As anthropologists have pointed out in the past, it is research that attempts to suggest that a group's "real" identity is at the genetic level that leads to consequent confusion of the biological and cultural characteristics (Juengst 1997a, Juengst 1997b). Juengst further argues "by superimposing our social and biological categories on such groups, we would increase the risk of discrimination against group members, and any protection that prior permission might afford would be immediately undone," (Juengst 1998a, Juengst 1998b).

Another argument against group consent is that human social groups are often nested within each other making it difficult to discern the appropriate level at which to seek approval and the appropriate culturally relevant authorities to approach. It may never be possible to protect groups like "Irish-Americans", "African Americans", and in some cases "Native Americans", groups that are often too abstract and heterogeneous to have a unified voice, but whose self-identified members can still suffer stigmatization and discrimination stemming from population genetic research. Philip Reilly argues "even if we accept the premise that there are ethnic groups in which all members could be threatened by misunderstanding or deliberate misuse of genetic information and that such groups should be afforded the opportunity to have a dialogue with investigators, the solution suggested still raises significant operational issues. This model of community participation and approval seems workable only with small groups that have a well-defined leadership structure. The challenge of seeking community approval within a tribe of a few hundred is imaginable, the challenge of seeking consensus among larger groups is not," (Reilly 1998).

Culturally Sensitive Individual Informed Consent

After reviewing many of these relevant articles involving group consent in population genetic research, I believe that there are many risks and benefits associated with this form of consent. Almost all of the authors and projects that are in favor of group consent in population genetic research, such as the HGDP, emphasize this level of consent in order to accomplish a degree of research protection. They believe that since what is learned in a population genetic study will have potential ramifications not only for the individuals surveyed, but also the population as a whole, that the proper form of consent is group-based. Those in favor of group consent believe that in order to protect the group from potential stigmatization and discrimination, population-based consent offers the greatest form of protection. Group consent gives a designated set of leaders, speaking on behalf of the group, the ability to weigh the consequences of participation in the study and then to accept or reject participation on behalf of their group.

Taking into account the various concerns involved in population genetic research, including arguments for and against community consent, I would like to examine whether or not there is a case for seeking culturally sensitive individual informed consent. The term '*culturally sensitive individual informed consent*', as I define it, involves **informed consent that is sought from individual members of a population who are sensitive to the relevant concerns of their population and have an active interest in the well-being of that population.** The position that I am advocating states that, in most cases, the proper form of consent to seek in population genetic research is culturally sensitive individual informed consent. I believe that culturally sensitive individual informed

consent extends an adequate amount of protection for populations at risk of suffering discrimination or stigmatization as a result of individual members participating in a research study. This form of consent also allows researchers to show an adequate level of respect for addressing the cultural concerns of the population without violating an individual's wish to participate.

What I suggest, in accordance with authors such as Eric Juengst, is that in most cases group consent be replaced with the consideration of group interests while soliciting individual consent. Rather than asking the group for consent, individuals that might choose to participate in the research would be told about the risks and benefits that may affect the populations to which they belong. Researchers would also communicate any culturally relevant risks of the proposed research and potential individual participants should also be made aware of the concerns raised by other population members during the process of community review of the proposed population genetic study. Ideally, these individuals would be active participants in the discussion between the researchers and the community.

Group Consultation

I want to make it clear that, although I am in favor of culturally sensitive individual informed consent, I still believe the populations play an important role in the informed consent process. Though I believe that in most cases the consent for participation should be granted on the individual level, I believe there should still be a process for including the population in the study. In population genetic research studies, such as the Human Genome Diversity Project, participants and their populations should

be seen as more than just subjects; they should also be seen as collaborators in the study. In many cases the populations that will be sought for inclusion in these studies will have traditions and beliefs that are different than those in the Western world. Consistent with one of the methods described in Eric Juengst's article "Groups as Gatekeepers to Genomic Research", I believe that there should be a preliminary consultation with selected groups to determine how best to secure culturally appropriate informed consent from individual members of a population (Juengst 1998a).

This form of involvement, often referred to as community consultation, is the topic of Sharp and Foster's article "Involving Study Populations in the Review of Genetic Research" (Sharp 2000). They believe that community review is an integral part of population genetic studies and that it helps the researchers identify the cultural concerns and helps protect against risks associated with genetic population studies. A unique idea presented in this paper is that different forms of community review should be tailored to each individual population. For example, formal community approval, a form of community review that involves the negotiation of a formal contractual agreement with the population's political representatives, *would only be appropriate in groups that have authorities empowered to speak for the study population*. Similarly, community consultation, which involves consulting a subset of the population's members, assumes the existence of shared communal interests and values (Sharp 2000).

I believe that involving members of the study population in the review process is an important part of designing and implementing all population genetic studies. In most cases I believe that the proper form of community review will involve a form of community consultation in which members of the population will have the opportunity to

relate their concerns about the proposed genetic survey. As collaborators in the project, the population can help the researchers design a study that is relevant to the concerns of the population. Furthermore, the population could help the researchers understand the cultural concerns in collecting the genetic material, concerns about discrimination and stigmatization, and how best to solicit consent from individual members of their population. Though they would have an integral part in the design and implementation of the genetic study, in populations without the cultural condition of group approval, the individual member would still have the last say in participation in the study.

Cultural Cohesion and Identity

Though I am in favor of culturally sensitive individual informed consent in population genetic research, there is a unique set of circumstances in which I believe this form of consent would not be the proper form of inclusion consent. It is in cases where within the customs of the population there is a sense of cultural identity and cohesion that extends to the decision-making authority of that community. In other words, within the population there is a cultural belief that all decisions, such as participating in a genetic study, are to be made by a ruling body or designated cultural leaders that the group identifies and respects.

In this case I believe that it would not be possible to solicit individual consent that is culturally sensitive to this population. This means that researchers would be unable to solicit truly sensitive informed consent from individuals because any individuals in such groups that might choose to participate without the consent of the designated leaders would not be in accordance with the customs of that group. Any individuals in this

circumstance, though they might otherwise have all the same cultural concerns of their population, would not be an apt representative of that population because they would not be respecting the culture's belief in community decision-making. This would also preclude seeking individual consent from people who live outside the population spread across the world. This form of seeking consent, often referred to as "forum shopping", relies on the researchers finding members of a population that are more amenable to the proposed research (Sharp 2000, Reilly 1998). Such individuals would not be apt representatives in either case because they would no longer be bound by the cultural decision-making authority of their population or still hold the same cultural concerns of that population.

In terms of community consultation with populations that have the cultural condition of group approval, the appropriate level of community review would be seeking formal community approval. In these groups, where the shared cultural cohesion and identity respect the decisions of recognized political representatives, it is still important to involve the community in the design and implementation of the genetic survey, but the final decision of the participation of members of this population would be made by these representatives. Seeking the participation solely from individual members from groups that have a cultural identity and decision-making process would be culturally inappropriate. Furthermore, I believe that these individuals would not be apt representatives of these populations, and therefore should not be included in population genetic studies.

Case Studies

In order to gain a better understanding of why there is such dissent about the role of group consent in population genetics, it may be helpful to outline a couple of cultural case studies that involve two groups that have been selected as possible participants in population genetic studies. The first of the two case studies deals with a currently active population genetic study in Iceland that has met with a great deal of controversy based on its protocol of informed consent. The second case, which involves a cultural analysis of the Navajo population, represents a group that has been sought for inclusion in many population genetic studies because the population has a well-defined cultural identity and custom for community decision-making.

A Case Study: The Icelandic Genome Database

In 1994 Harvard neurologists Kari Stefansson and Jeff Gulcher traveled to Iceland to work with John Bendix from Iceland's National Hospital on a population genetics study of multiple sclerosis (Hodgson 1998). In the process of collecting and studying genetic material for this survey, Stefansson contemplated the creation of an Icelandic population database. Stefansson believed that Iceland's 270,000 citizens, in terms of a human population genetics, were an ideal population to study for many reasons. First, nearly all the people of Iceland are descended from a small founder population that settled the island 1000 years ago and these people have lived in relative isolation from the rest of the world. This means, that in terms of the diversity of their genetic material, they are quite homogenous as a population. Second, the National Health Service of Iceland has kept excellent medical and family records since its creation in 1915, making it easier

to identify a genomic locus linked to disease. Third, Iceland has a well maintained tissue bank in existence that has stored samples from two or three earlier generations of families that goes back 40-50 years (Dorey 1998, Marshall 1997).

With an initial investment of 12 million dollars Stefansson created deCode Genetics Inc., a Delaware-registered genetic company based in Reykjavik, Iceland (Marshall 1997). In March of 1998, Stefansson helped sponsor a bill in the Icelandic Parliament to create a National Genome Database that sought to collect and store genetic information from the entire Icelandic Population. After various revisions, a second draft of the bill was presented to the Icelandic Government and on December 17, 1998 the bill was passed with 37 to 20 majority vote (Berger 1999, Crosby 1999). Shortly thereafter, deCode Genetics was granted a 12 year exclusive contract to operate and maintain the Icelandic genome database.

One of the most controversial and ethically challenging aspects of performing the Icelandic genetic survey has been developing a policy for informed consent. Specifically, in terms of group consent, deCode believes that they will proceed with a method of presumed consent where all Icelandic citizens are considered part of the study unless they chose to fill out a form opting themselves out of the study. This method of consent has met with varied enthusiasm and rejection by various groups and individuals concerned about the possible harms to themselves and the population resulting from the population genetic survey. As a case study for population genetics, I would like to evaluate the idea of soliciting culturally sensitive individual informed consent rather than presumed consent in the Icelandic genetic survey.

I believe that the best method for securing ethical and culturally appropriate consent in the Icelandic survey is to obtain consent from culturally sensitive participating individuals. I do not defend the method of assuming presumed consent in this survey nor do I believe that this is a case where researchers must solicit group consent. Various aspects of the Icelandic population's identity and what I believe to be a moral duty to solicit informed consent from individuals before inclusion into the genetic survey motivate my recommendation for culturally sensitive individual informed consent in this case.

First and foremost, many people argue that it is too hard or inappropriate to solicit group consent from groups that have population members that are not centrally located in one geographic area. Groups that have a large inclusion of members are often spread across various geographic locations and divided into many subunits such as tribes or sects. Although they are unified under an overarching name, each subunit may have particular interests and concerns that are linked to the presence of environmental and social factors surrounding the location. In these cases, although they might share a genetic and even a cultural identity, their concerns about how a genetic study might affect their group could be different. Iceland, however, does not have this problem. Not only is their population genetically homogenous and relatively small in size (only 270,000 citizens), but they are all centrally located in one geographic area.

Furthermore, members of the Icelandic population have a rich history and tradition that stems back over 1000 years from when the first founder population settled the island. Their well-maintained medical and family records that have made them an attractive population for genetic study also show dedication and pride about the history of

their population. There is a cultural cohesion and identity that all members of the Icelandic population seem to share, and this trait, some may argue would demand that researchers seek group consent from the Icelandic population before conducting a genetic survey. Although I agree that there is a strong and unique cultural identity amongst the members of the Icelandic population, I still do not believe that group consent is the proper method of soliciting consent in this case.

When I made my exception to seeking culturally sensitive individual informed consent, I said that in groups that have a strong sense of cultural cohesion and identity, that group consent should be sought. In these groups, it is the case that certain individuals are designated to speak for the entire population, and group consent is not only warranted, but shows the proper respect to the cultural identity and traditions of that group. Although they have a strong sense of cultural cohesion and identity, the Icelandic population does not have within its current cultural belief system the need to seek consent from designated members of the population that are empowered to speak for the entire nation. I believe that the Icelandic population does have a strong sense of nationalism, but this is different from saying that they have a cultural cohesive element that would require soliciting group consent.

Nationalism, the devotion to the interests or culture of a country, is different than the cultural and spiritual cohesion of groups that have a respect for group decision-making authority. The cultural identity that many Native American groups share goes beyond the genetic and cultural heritage that homogenous population members might share. Explicitly, when it comes to group consent, groups with a strong sense of nationalism do not necessarily have a cultural respect for group decision-making

authority. As in many democratic nations, Iceland does have a political body that is elected to represent the interests of the population in domestic and foreign affairs. However, these elected officials do not necessarily represent the spiritual and moral desires of every member of their population. While these leaders are entrusted with making decisions about the economy and health care on a whole, they are not empowered to make individual health care decisions for members of their population.

It is the case, however, in groups that have a strong sense of cultural cohesion and a respect for population's decision-making authority that respected leaders do make these kinds of decisions. When tribes select members to be their leaders, they are not only representatives of their political interests, but their cultural and spiritual views. These types of leaders would be entrusted to represent the group's attitude toward participating in a population genetic study because they could weigh the potential benefits and harms to the population as it would affect the beliefs of the population. Leadership in this circumstance means more than representing a population; rather, it means making sure that research does not bring cultural or spiritual harm. Though many Native American Groups are concerned with physical harms that might arise as a matter of participating in population genetic research, they are also concerned about the social and spiritual ramifications. These actions reaffirm the group's need to protect the use of traditional medicines and practices and their spiritual beliefs about the sacredness of life and the natural world (Indigenous Peoples Coalition Against Biopiracy 1997). This is the ideal that should be honored when soliciting group consent rather than its shared national heritage.

This sense of nationalism and group identity, coupled with their homogenous genetic makeup does, however, make the Icelandic population a particularly susceptible group to discrimination and stigmatization that may result from their inclusion into a population genetic study. Although there was a reported 88% approval rating for the project in 1999 and over 700 newspaper articles, 400 radio and TV programs, and numerous town meetings and university-sponsored conferences in the debate about creating the Icelandic database, I do not believe that this would override the need for seeking consent from individuals for inclusion into the Icelandic genetic database (Gulcher 1999, Gulcher 2000). In seeking informed consent from those who chose to participate in the Icelandic genetic database researchers could be assured these people would have the cultural concerns and have an active interest in the well-being of the population.

Case Study: The Navajo

The Navajo represent one of the groups that the HGDP and other population genetic research projects wish to study which have a different cultural and spiritual view of the world than in many Western societies. As of 1997, the Navajo represented the largest tribe in terms of population size in the United States, with approximately 250,000 members (Dukepoo 1997). Ever since the conception of the HGDP in 1991, it has met with a wide range of concerns from Native American Populations (including the Navajo) about the nature of collecting genetic samples. Many spokesmen for Native American concerns, including Frank Dukepoo, a Hopi Indian and geneticist from First Mesa in Arizona, believe that the conflict between Native Americans and the HGDP relates to

1-2-22

their conflict in worldviews. Dukepoo points out that “the impasse we are experiencing is deeply rooted in the clash of cultures, values, and worldviews,” (Dukepoo 1997). He further points out that, although all American Indians do not share a common cultural heritage, they often share a common world view that sometimes contrasts with Western society (Dukepoo 1997).

When American Indians first learned of the HGDP in 1991, it was this contrast in worldview, including cultural and spiritual differences, that led them to oppose the project. In the first place, many Native American tribes are hesitant to become involved in any endeavor with the Western world, based on the history of exploitation and discrimination of their people. In the light of over 500 years of colonization, deceit, and exploitation many tribes are hesitant to participate in a project that is often referred to as a new form of exploitation called ‘biopiracy’ (Dukepoo 1998, RAFI 1997). The term biopiracy is associated with collecting genetic samples from indigenous populations by Western researchers for intellectual and financial gain without returning any form of benefits to those populations.

In terms of my thesis and the issue of group consent, many of the leaders of Native American tribes who have learned about the HGDP have opposed the collection of genetic material from any member of their populations. They reaffirm the authority of the governing entities of these indigenous tribes to refuse participation for any member of their populations. They believe that the “ethical principle of individual informed consent is applicable, but is secondary to tribal government consent,” (Indigenous Peoples Coalition 1996). In order to gain an understanding of why many Native American populations, such as the Navajo, are against the HGDP I believe it is necessary to

examine their cultural and spiritual worldview as well as their organizational leadership structure.

The strong cultural identity and cohesion that characterizes the Navajo people comes from their personal relationships with their family and others in the tribe.

“Navajo” is not the actual word that they use to describe themselves; in their own language they are *dine*, which means “The People”. This term represents the fact that the Navajo are made up of a society of individuals who have a strong sense of belonging with the others who speak the same language and a strong sense of cultural identity (Kluckhohn 1974). Subsequently, Navajo religion and healthcare have a similar strong sense of traditional value based on their cultural identity.

The cultural unity that many Navajo tribes share stems from shared cultural heritage, common language, and a common designation for themselves as “The People” as distinct from all others (Kluckhohn 1974). Navajo religion is directed toward the maintenance of harmonious relationships between man, nature, and the supernatural (Kunitz 1983, Trennert 1998). This has a strong relevance in their concepts about healthcare, disease, and illness. When traditional Navajo healers wish to address the problems associated with an individual’s illness, they do not focus on the symptoms, but rather the cause of the illness. Disease may be contracted by causes such as spirit possession, witchcraft, and breach of taboo (Kunitz 1983). Although Navajos make use of modern medicine, there is little incorporation of this foreign concept into their traditional belief system. The healing system is a sacred core of the Navajo religion.

This form of cultural cohesion and identity is different in the case of the Navajo as compared with the population of Iceland. Where Icelanders have a sense of community

that is akin to nationalism, the Navajo have a sense of community that is based on spiritual and cultural tradition. Navajo individuals are deeply connected with their relatives, ancestors, and fellow tribe members on a level that is greater than pride for their recognized political sovereignty. When individuals recognize themselves as members of the Navajo nation, it represents a responsibility to protect the dignity of their family and traditions. One of the worst insults that can be said of a Navajo is that they act in a manner as if they “didn’t have any relatives”. On the other hand, a great compliment is to say that a person acts in a manner as “if everyone is related to you,” (Kluckhohn 1974).

It may be wrong, however, to refer to the Navajo as an organized, centralized political entity (Kluckhohn 1974). In the past the Navajo were treated as if they had a community identity by the United States government. In 1970 the Indian Health Service (IHS) was formed in order to address the evolving concerns about health care issues of many Native American tribes (Trennert 1998). The IHS did not always see eye to eye with the Navajo Tribal Council, and late in 1970 the Navajo established its own Navajo Area Indian Health Advisory Board to specifically address their concerns (Trennert 1998). For example, 1995 the Navajo Tribal Council announced that its people were tired of being “guinea pigs” for medical experimentation (Trennert 1998). The Navajo Tribal Council believes that some research programs approved by the IHS seemed to benefit only the researchers and their organizations (Trennert 1998). Even though the twelve person IHS board was made up mostly of Navajos, tribal officials felt that it was far too lenient in accepting research proposals that showed little to no benefit to the members of the Navajo people.

Although I believe that in groups, such as the Navajo, who have a tradition of group decision-making, it is proper to seek group consent, it can be difficult to determine from whom to seek this consent. When many researchers speak of seeking group consent from members of the Navajo population, it is unclear whether they wish to seek consent from individual tribal leaders, the Indian Health Service, or the Navajo Tribal Council. It is important to seek consent from the leaders that are the culturally recognized spokesman for each tribe. In the case of the Navajo, the Navajo Tribal Council is made up of the designated leaders who are given authority to speak on behalf of the entire population. Therefore, in order to respect the cultural and traditional values of the Navajo population, the tribal council would be the proper authority to seek consent for participation in a population genetic study.

Finally, when it comes to seeking consent from groups that have a strong sense of group identity and cultural cohesiveness with a deeply rooted tradition of group decision-making, seeking the consent from the designated group leaders is required. This would most certainly preclude individual members from participating in population genetic studies against the behest of the designated population leaders. I believe that one of the most important ideals that researchers wishing to conduct population-based studies must proscribe is the notion of compromising the cultural concerns and wishes of the populations to complete their study. True cultural sensitivity and informed consent are the hallmarks of promoting good faith and active cooperation between researchers, participating members and their population. In return, if researchers truly respect the cultural concerns and identity of these populations that have had problems with Western

researchers in the past, they might be able to earn back the trust of these groups and future participation in other genetic studies.

Objections and Considerations

It has been my intention to show that the issue of group consent in population genetic research is one that is fraught with moral and philosophical problems. The problem that I have been focusing on is determining the proper level of informed consent in population genetic research. The position that I am advocating is one of many that tries to find a way to balance the need for cultural sensitivity with the moral issue of informed consent (Juengst 1998a, Grounds 1996, Liloqula 1996). Many of the people who have written articles about the Human Genome Diversity Project and other proposed population genetic research projects disagree on what is the correct method for securing informed consent, while at the same time securing participation. Those most interested in the issue of informed consent in population genetic research come from multi-disciplinary backgrounds such as philosophy, anthropology, sociology, and genetics. Consequently, they have varied opinions and moral reasoning regarding why group consent should or should not be required in population genetic research. While some might believe that the position that I have outlined is wrong for promoting a method of individual informed consent, culturally sensitive or not, others might believe that I have not gone far enough.

As I have tried to show, many of the populations that might be included in the Human Genome Diversity Project come from cultural traditions and moral philosophies that are different than those in the Western world. Indeed, the issue of informed consent

in medical research is one that finds its roots in Western moral philosophy. The designers of the HGDP believed that they had to solicit the individual informed consent of each participant according to the Nuremberg Principles, the Helsinki Declaration, and U.S law (Model Ethical Protocol 1997). These regulations and declarations came about after past abuses in medical research in which individuals were included in medical experiments without their consent or under great risk to their health with little benefit. A concrete example of this would be the Nazi medical experiments carried out during World War Two, in which individuals were “recruited” into research without their consent and included in experiments that had great risk of harm with little benefit.

Requiring consent from participating individuals is the best way, many researchers believe, to protect individuals against exploitation and harm. This gives individuals the opportunity to weigh the possible benefits and harms that participation in the research might involve, and gives them the ability to make an informed and autonomous decision. Autonomy in making one’s decisions is a moral ideal that has found its way into many aspects of Western society. As many people living in the Western world have become more educated and informed about medical interventions and research, they have sought to gain a greater sense of control over their choices and options. In Western societies the ability to choose for oneself is a highly prized moral right that can be found in the constitutions of many countries. Certainly a genetic survey, such as the Human Genome Diversity Project, that was created in the Western world sought to include a method of soliciting individual consent for inclusion into their research.

However, as I have pointed out in numerous sections of my thesis, many of the populations that could possibly be collaborators with the HGDP come from non-Western countries or cultures that do not subscribe to Western moral philosophy. When the HGDP designed its protocol for soliciting participation, they had this idea in mind. Consequently, they decided to include a second level of consent on top of individual consent. In some of these groups there is a moral tradition that honors the decision-making authority of the group over the autonomy of individuals. In groups such as these, designated group leaders spoke on behalf of the wishes of the group, having the ability to offer their participation or rejection to participate in genetic research. It was only after these designated group leaders had given permission to participate in genetic research on behalf of their group that researchers could then solicit participation from individual members of that population.

It is because of this ideal that many philosophers, anthropologists, and other interested researchers have formulated opinions about the need for group consent and even individual consent in population genetic research (Model Ethical Protocol 1997, HGDP Summary Document 1993, Gostin 1991). While I believe, in most cases, that the proper form of consent to seek in population genetic research is culturally sensitive individual informed consent, there are those who believe that this position is inconsistent. It may be the case that requiring individual consent as well as group consent in a population genetic study may not be the most culturally sensitive approach. There are some philosophers and anthropologists that believe, contrary to my position and also to that of the HGDP, in groups with a cultural identity and group decision-making tradition that group consent should be the **only** form of consent. The argument made is that if

researchers are to be truly “culturally sensitive” to groups such as these that we should seek consent only from the culturally respected leaders of the group, and not the individual consent of participants, a tradition that is grounded in Western moral philosophy.

Advocates for this position believe that requiring group consent and individual consent are ideals that are inconsistent in population genetic research that involves groups that have a strict group identity and group decision-making tradition. The concept of autonomy and individual decision-making authority are not only inconsistent with the views of these populations, but it could be considered an insult to ask the permission of the designated population leaders and then turn around and challenge their authority by also requiring the consent of an individual member of their population. Those who advocate for this position believe that this is the real reason that once researchers have gone to the culturally respected leaders of a population and been refused participation, that it is morally objectionable to try to solicit participation from individual members of that population. If researchers want to show respect for the cultural identity and autonomy of the groups decisions, they cannot decide to try to turn to the consent of individuals after the decision does not go their way. If researchers are going to extend the right of acceptance or refusal to these designated population leaders, then they should respect the decision that they make.

While on the surface this seems like a plausible, and even a preferable way of showing cultural respect for group consent, it has many possible ethical problems. Seeking individual consent in population genetic research is a protocol that is required for more than one reason. Presumably, the question that many researchers and philosophers

would ask is if groups can grant consent on behalf of members of their population without individual consent, could individuals be forced to participate against their will? This presents an approach that is different from what I have been talking about so far. The new question here is what happens when the group leaders say 'yes', but the individual says 'no'? Though it might be rare that individuals in groups that have a strong sense of group identity and cohesiveness refuse participation, the possibility still exists that individuals might choose not to participate.

It may be the case that extending to the culturally respected leader the sole right to grant inclusion or exclusion on behalf of their group presents a case that exposes populations to greater risks for discrimination and stigmatization rather than protection. By not giving individuals the ability to give their consent to participation in genetic research on top of group consent, I believe that researchers would be going down a dubious path. It may be argued that in cases where the risk of harm to the individual and the population are minimal, that researchers should be able to solicit individual consent though their culturally respected leaders disagree. An example of this case would be that individuals who suffer from a particular disease or illness that researchers wish to study would be allowed to participate against the wishes of their designated population leaders. It is my belief that in populations with respect for the cultural decision-making authority of designated group leaders that researchers should not seek participation from these individuals. However, in populations without this designation, I believe that individuals should be allowed to participate in a population genetic study though the majority of that population may disagree. I will address this issue in the following paragraphs and sections.

The dilemma of respecting individual autonomy in population genetic research is not unlike the cultural dilemma that many physicians face in medical decision making when the choice whether or not to pursue a specific treatment regimen or surgery is not made by the patient. In families that have a cultural tradition that designates decision-making authority to the patriarch of the family, this is the person who is respected by the family to make such a decision, not the patient. Physicians are faced with a moral dilemma if it is the case they believe that the decision of the patriarch is not the correct decision. In other words, it is potentially harmful to the patient. The debate is whether or not physicians should circumvent the decision of the patriarch and try to convince the patient to make a different decision.

The issue being addressed here is whether or not it is morally defensible to solicit participation from an individual against the wishes of the designated decision-maker if the risk to the health of the individual is high. In terms of a population genetic study, can it be argued that the harms associated with non-inclusion of an individual in a population genetic study can outweigh the need to respect the decision of a populations culturally respected leaders not to participate? I believe the answer to this question, in terms of a population genetic study is 'no'. The issue that is really outlined here is not risks associated with the non-inclusion of individuals, but whether it can be argued that there are some benefits that may be lost by not allowing these individuals to participate.

There are two important considerations to remember here that are particularly congruent with the Human Genome Diversity Project. The first is that any benefit that may result from inclusion within the HGDP is *potential*, and never a guarantee. So when it is argued that individuals should be allowed to participate because doing so would lead

to benefits that outweigh the need to respect a groups decision-making authority, this is not necessarily the case. Second, and more importantly, there is no genetic disorder or illness that is unique to a particular population so that exclusion of one population would preclude genetic research. While people in these populations are more likely to have some genetic markers in common, markers will not solely be found in all members of one population and in no members of another. The key point is that a population may have a greater frequency of a particular genetic malady, but this does not mean that the same malady could not be found in another population in a different frequency. Allowing individuals to participate against the wishes of their population would almost certainly be a sign of disrespect to the cultural decision making authority of the designated population leaders. It would, however, be misleading to say that researchers or individuals should be able to circumvent this authority because the research offers them the only or increased benefits that would otherwise be lost by non-participation.

However, in population genetic research, it could be argued that the culturally respected leaders might still make choices that are harmful or otherwise detrimental to individual members. The question that I and other researchers and philosophers are posing is at what point must we strictly honor the group decision-making authority of populations and in what circumstances might it be morally permissible to circumvent this decision? If designated population leaders make a decision to participate or not participate based on ideas that are considered “irrational” or just plain wrong, should it be the case that their decision should be ignored? This notion is particularly difficult and morally problematic because researchers are dealing with cultures and customs that in the eyes of Western biomedical science might seem confusing, “primitive”, or misguided.

Yet, to circumvent this decision-making authority just because these customs do not conform with our view of the world would certainly be wrong. This is the type of moral reasoning that would lead to disrespecting the autonomy of a population because their traditions and ideals are not congruent with our own. I believe that it is worthwhile to examine a case where researchers consider the decision of the designated population leaders to be “irrational” and might wish to circumvent their decision-making authority.

It may be the case that a set of culturally respected leaders make a decision to participate because they are absolutely convinced that the research will lead to a cure or decide that their group should not participate solely because they are convinced researchers are developing specially targeted “gene bombs” to commit genocide (Moore 1996). What makes this position morally problematic is deciding where to draw the line. How do researchers draw a distinction between what is “irrational” and what is culturally different? Such an arbitrary line, I would argue, would be difficult if not impossible to draw. The notion of being able to circumvent a decision, no matter how irrational it might seem, in population genetic research can almost never reach a culturally sensitive compromise. The possible benefits and harms raised as a matter of pursuing a population genetic survey are complicated and culture specific. If it is the case that a population has views and beliefs that are inconsistent with the research and Western bioethics in general, it may never be possible to conduct the survey. Though some researchers believe that it is worthwhile to try to show how certain beliefs may be inconsistent with Western scientific axioms, I believe those ideas should never be “forced” on a population. To do so would undermine the purpose of doing population genetic research and might instead lead to the destruction of the population’s culture rather than saving it.

Practicability and Presumed Consent

Though seeking solely group consent in population genetic research may be problematic and harmful to individuals, in other realms of genetic research it is not uncommon that individual consent may be waived. In the current National Bioethics Advisory Commission (NBAC) report there is an entire section dedicated to criteria for the waiver of consent. Although current federal regulations require individual consent for research, this requirement can be altered or waived if all of the following four criteria set forth in the federal policy for the protection of human subjects, 45 CFR part 46, are met (NBAC Report 1999). They include: the research involves no more than minimal risk, the waiver of consent will not adversely affect the rights and welfare of the subject, research could not practicably be carried out without the waiver or alteration of consent, and subjects will be provided with additional pertinent information after participation (NBAC Report 1999). While the first, second and fourth do not seem to apply to the issue of group consent in population genetic research, an argument can be made using the philosophical foundation of the third criterion to bypass individual consent in population genetic research.

Researchers who wish to request the waiver of informed consent in the use of human biological material must provide evidence to an institutional review board that it is not practicable to obtain consent (NBAC Report 1999). The word that sticks out in this criterion is the word 'practicably' which means something that can be done or is possible in practice. Cases that they cite as examples include when there are more subjects than individuals to seek consent, in other words the time it would take to contact the subject

will take longer than the study, or the cost of contacting the individuals far exceeds the researcher's budget (NBAC Report 1999). Although none of these cases would fit the HGDP, the idea that seeking consent can be impracticable does. In practice it may be impossible, if all the individual identifiers are removed from the genetic material, to seek future consent from participating individuals. It is considered necessary in pursuing a population genetic survey to leave the name of the population on the sample, but no other identifying marker of the sampled individual.

Currently, it is standard practice to name ethnically, geographically, and linguistically identifiable populations in public databases and scientific publications (Foster 1998). It may be possible not to include all the specific information that will allow someone to identify a group, for example, say a Navajo group that lives in the southwest rather than naming a specific tribe or location. However, whichever way it is done, names of individuals will not be included in the database, though they might be collected. Therefore it may not be practicable to solicit individual consent on further genetic research that might be done after genetic material has already been collected. This means that if the HGDP wanted to use genetic materials from populations that have already been collected, they would have no recourse but to solicit consent from the culturally specific leaders that represent the identified group.

However, I believe that this presents a problem in conducting population genetic research that would in effect be soliciting "blanket consent" from individuals when the original material is collected. Considering that we still require individual consent on top of group consent in population genetic research, such as the HGDP, the individual will only know what research is to be conducted on the material at the time of collection. If

researchers wish to do any other research involving that genetic material, then they will have to seek consent from culturally respected leaders of groups that have cultural identity and group decision-making responsibilities. Furthermore, akin to the Icelandic genetic survey, it would also be impossible for potential individuals to ‘opt out’ of a research study. Even so, if an individual did decide to opt out of a population genetic survey, this would by no means protect that individual from suffering stigmatization or discrimination from the survey. Opting out of a genetic survey would only be effective if an entire group decided to withdraw their genetic material, not just an individual. This is the real problem with presumed consent in a population genetic research, and a dilemma that would be particularly salient for the HGDP.

The notion of presumed consent runs counter to the position agreed to by the American Society of Human Genetics in which “investigators are encouraged to develop procedures for obtaining informed consent when prospectively collecting specimens for genetic research purposes,” (ASHG 1996, Hodgson 1998). Without the requirement for informed consent those who are included in the study do not know what their genetic material might be used for. In effect by yielding to presumed consent, those who are included into the genetic database have granted the researchers “blanket consent” to do whatever genetic studies they see fit. There is no requirement in allowing presumed consent for researchers to provide a detailed explanation of what the possible benefits and harms of the research might be that they are going to perform.

The chance that research in the Icelandic study may lead to discrimination and stigmatization of the entire population would be higher because the ability to demonstrate respect for concerns about the study would be compromised. Icelandic citizens who

believed that a particular study would do particular harm could opt out of the study, but the results learned in the population genetic survey would still affect them. Furthermore, Icelandic citizens had only till June 17th, 1999 to opt out of the study before researchers would begin to include genetic material into the database. If a person decides at a later date to withdraw from the study, information that has already been entered in to the database would not be removed (Duncan 1999, McInnis 1999). This policy assumes that every individual who wishes to opt out will have an equal opportunity to access the forms. If for some reason a person is unable to fill out the proper forms in time they are out of luck, the window of opportunity has passed. Even if they decide to change their mind, their genetic material will not be withdrawn.

The Human Genome Diversity Project, unlike the Icelandic genetic survey, intends to collect genetic information from many populations rather than just one. Presumed consent would be impractical and morally problematic for a number of reasons. First of all, presumed consent assumes that it is possible and relatively easy for potential participants to find and fill out forms to effectively opt themselves out of the study. This may not be possible with groups that are located far from places where they can get these forms or even have the time, resources, and understanding to fill them out and send them to the proper authorities. Second, presumed consent would not be a proper way of showing cultural sensitivity to any group, whether or not they had a cultural identity or group decision-making tradition. It would be impossible to discern all the culturally relevant concerns and information from populations. Informed consent allows both the researchers and the populations to communicate their concerns and questions along *each* step of the research. As new research is proposed, new concerns and possibilities for

harm may arise. *Presumed consent does not promote dynamic communication between researchers and populations, but rather relies on previous knowledge based on a limited set of circumstances.* While the majority of a population may be in favor of one phase of research, other forms of research that generate more significant concerns and potential for harm may not persuade them.

Similarly, presumed consent assumes that because the majority of the people are in favor of the research, the burden should be placed on the individuals who disagree to opt out. However, this right would be practically useless to individuals in groups that share a sense of cultural cohesion and identity because it would be improper for members of these groups to speak out individually against the decision of the group. Just as it would be culturally problematic to include members of these populations in a population genetic study after their population vetoed their inclusion, it could be argued that it would be just as culturally inappropriate to allow individuals to opt out.

These ideas, that opting out would be both ineffective and culturally insensitive, prevent presumed consent from being the proper form of consent for the HGDP under any circumstances. It may be, however, that other population genetic studies which target specific populations that the majority is in favor of pursuing might decide on presumed consent. The NBAC report on Research Involving Human Biological Materials lists opting out as an additional measure of protection when the consent requirement has been waived (NBAC 1999). This still extends the right for an individual to refuse participation in the study, but places the burden on that individual to do so. If consent has been waived originally, then if a person did not opt out their biological material could be used for multiple research projects. However, the NBAC states that in a research study where

consent was not waived, additional research would not be conducted on a biological sample unless the person responded with explicit consent (NBAC 1999).

As a final thought about the issue of presumed consent in population genetic research, I believe that this form of consent can never be used instead of informed consent. Proponents of presumed consent believe that researchers place too much emphasis on individual rights and autonomy, and ignore the larger communitarian outlook that respects the needs of the larger community. This communitarian view holds that individuals have a moral duty to help others when the cost to the individual of helping is low. However, it is unclear that individuals have a duty to help others as clearly as they do not to harm other individuals. In population genetic research the benefits of the study are not always clear, and can never be guaranteed. Though harms, such as discrimination and stigmatization are a risk that every member of a population may face, the benefits do not necessarily extend to every member.

The benefits of presumed consent may not be clear to those whose moral principles are not grounded in communitarianism. However, proponents of presumed consent could point out that it is the case that many of the populations that may be collaborators in population genetic studies do have cultural identity consistent with communitarianism. Previously I made the argument that groups that share a cultural cohesion and identity should have the right to refuse participation on behalf of their group through their culturally respected leaders. This sense of community identity can be argued to be congruent with the moral philosophy of communitarianism. Therefore, if researchers wish to be consistent with the inclusion of presumed consent in population genetic research, this means that the population leaders would have the sole authority to

opt out their population. If researchers are willing to extend the right of refusal to designated population leaders during informed consent, then they should also extend this right if it were the case that presumed consent were utilized.

Rights extended to culturally respected leaders through informed consent, I believe, are different than those extended in presumed consent. When I made my argument for respecting the cultural identity of a population it was because I believe that this is the most effective way to promote understanding and respect between researchers and that population. Consent is informed so both the researchers and the collaborating populations understand the potential benefits and harms that participation in the research might present. Researchers would be able to understand the cultural concerns of the population, and the population could understand the methods and aspirations of the research.

Presumed consent does not offer the same sense of collaboration and understanding as informed consent, instead distancing the researchers from the population. Each different research proposal has unique circumstances that might contrast with the cultural concerns of a population. If for some reason researchers were not able to contact a population and decided to proceed with research that was different than the original research, this most certainly could have repercussions that could lead to discrimination and stigmatization of the population. The only way to offer protection against this from happening is to make sure that both the population and the researchers fully understand the possible benefits and harms that each research proposal might include. Just because a population is in favor of one form of research that offers benefits that are valued by both the researchers and the population, does not mean that this is true

of all research. In the past some collaborating populations have been exploited by researchers who made invalid assumptions. Presumed consent would not be the best way to rebuild this trust and show respect for the culture, values, and worldviews of these populations.

Conclusion

The Human Genome Diversity Project is perhaps one of the most controversial scientific endeavors ever conceived. It is a multi-disciplinary project that involves research in the fields of genetics, anthropology, sociology, and others that have contrasting values and ethics. Subsequently, because it is a population genetic survey that aims to include populations from all over the world, those contrasting values and ethics must also be balanced with various cultural and ethnic concerns. Taking this into account, it is not hard to see why the Human Genome Diversity Project, and population genetic research on the whole is a complicated venture. To further complicate matters, many of the populations that are sought as collaborators in population genetic research have been exploited, stigmatized, and discriminated against as a result of participating in past scientific research.

If researchers ever hope to rebuild and strengthen their relationship with these populations, they must understand the culture and concerns that are meaningful to those populations. As Frank Dukepoo pointed out, it is not our scientific understanding or interpretations of law that generates controversy and misunderstanding, but the clash of cultures, values, and worldviews (Dukepoo 1997). This is why all researchers involved in population genetic studies must first and foremost include the populations as

collaborators in the research every step of the way. **Informed and direct communication with the populations is key to promoting ethical and culturally sensitive research that promotes the cooperation of the population while taking seriously their cultural and moral concerns.** This is the paramount reason that group consent in population genetic research is a pivotal issue.

The designers of the HGDP believed that the “population-based nature of the research requires population based consent,” (Model Ethical Protocol 1997). I believe that this means more than extending population group consent because what is learned about one member will be learned about every member in a population genetic study. It means that the research that is being conducted is something that every member of a population has a potential investment in, relating to the future of their population. This view is either consistent with the scientific research being conducted or in some way fundamentally different. No matter which approach the population decides to follow, we must respect their choice.

Finally, I have tried to show that when it comes to soliciting consent for participation in a population genetic study that, in most cases, the proper form of consent is culturally sensitive individual informed consent. It is only in groups that have a shared cultural identity and a condition of respect for group decision-making authority that consent should not solely be solicited from individuals. In such groups, it would be inappropriate to solicit consent solely from individuals, but in addition should be granted by the group’s culturally respected leaders. Population genetic research, such as the proposed Human Genome Diversity Project, could then proceed knowing that they have gained consent from individuals who are aware of the cultural concerns of their

population, but also believe that the benefits of the study outweigh the potential harms to themselves and their population.

It has been my aim to show that, in some cases, it is possible to respect the cultural concerns of a population and protect them from possible stigmatization and discrimination by seeking culturally sensitive individual informed consent rather than group consent in population genetic research. I believe that there is value in pursuing population genetic studies that intend to research biomedical and anthropological questions that are relevant to both the population and the researchers. Seeking the proper level of informed consent to participate in these studies will allow both the researchers and the participating population members to feel confident that they are promoting ethical research practice in a field that has been wrought with historical controversy. If research studies such as the HGDP are able to continue with this spirit of collaboration and ethical practice, this will no doubt help polish the tarnished reputation of genetic studies and promote participation in future population genetic studies.

BIBLIOGRAPHY

- American Society of Human Genetics (1996). "Statement on Informed Consent for Genetic Research." American Journal of Human Genetics **59**: 471-474.
- Berger, A. (1999). "Private company wins rights to Icelandic gene database." British Medical Journal **318**: 11.
- Caplan, A. L. (1994). Handle with Care: Race, Class, and Genetics. Justice and the Human Genome Project. Timothy F. Murry and M. A. Lappe. Berkeley: University of California Press. 30-45.
- Cavalli-Sforza, L. L., A. C. Wilson, et al. (1991). "Call for a worldwide survey of human genetic diversity: a vanishing opportunity for the Human Genome Project." Genomics **11**(2): 490-1.
- Clayton, E. K. S., MJ Khoury, E Thomson, LB Andrews, et al. (1995). "Informed Consent for Genetic Research on Stored Tissue Samples." Journal of the American Medical Association **274**(22): 1786-1792.
- Cook-Deegan, R. (1994). The Gene Wars: Science, Politics, and the Human Genome. New York: W.W. Norton and Company.
- Crigger, B. J. (1995). "The "vampire project" [news]." Hastings Center Report **25**(1): 2.
- Crosby, J. (1999). Iceland: the selling of a nation's genetic code. Star Tribune. Minneapolis-St. Paul. World Section. February 10, 1999.
- Dodson, M. and R. Williamson (1999). "Indigenous peoples and the morality of the Human Genome Diversity Project." Journal of Medical Ethics **25**(2): 204-8.
- Dorey, E. (1998). "Roche deCODEs Icelandic population in \$200 million deal." Nature Biotechnology **16**: 225-226.
- Dukepoo, F. C. (1997). "Native American Perspective on Genetic Patenting." Submitted to American Association for the Advancement of Science. Washington D.C.
- Duncan, Nigel. (1999). "World Medical Association Opposes Icelandic Gene Database." British Medical Journal **318**: 1096.
- Evans, D. and M. Evans (1996). A Decent Proposal: Ethical Review of Clinical Research. New York: John Wiley and Sons.

- Feinberg, J. (1990). Harmless Wrongdoing. Oxford, Oxford University Press.
- Foster, M., A. Eisenbraun, et al. (1997). "Communal Discourse as a Supplement to Informed Consent for Genetic Research." Nature Genetics 17: 277-279.
- Foster, M. W., Deborah Bersten, and Thomas H. Carter. (1998). "A Model Agreement for Genetic Research in Socially Identifiable Populations." American Journal of Human Genetics 63: 696-702.
- Foster, M. W., R. Sharp, et al. (1999). "The Role of Community Review in Evaluating the Risks of Human Genetic Variation Research." American Journal of Human Genetics 64: 1719-1727.
- Foster, M. W. and R. Sharp (2000). "Genetic Research and Culturally Specific Risks." Trends in Genetics 16(2): 93-95.
- Gillis, A. M. (1994). "Getting a picture of human diversity." Bioscience 44(1): 8-13.
- Gostin, L. (1991). "Ethical Principles for the Conduct of Human Subject Research: Population-Based Research and Ethics." Law, Medicine, and Health Care 19: 191-201.
- Gostin, L. (1995). "Informed Consent, Cultural Sensitivity, and Respect for Persons." Journal of the American Medical Association 274(10): 844-845.
- Greely, H. (1998). Informed Consent, Stored Tissue Samples, and the Human Genome Diversity Project: Protecting the Rights of Research Participants. Stored Tissue Samples: Ethical, Legal, and Public Policy Implications. R. F. Weir. Iowa: University of Iowa Press. 89-108.
- Grounds, Richard. (1996). "The Yuchi Community and the Human Genome Diversity Project: Historic and Contemporary Ironies." Cultural Survival Quarterly 20(2): 64-68.
- Gulcher, J. and K. Stefansson (1999). "The Icelandic health care database: a tool to create knowledge, a social debate, an a bioethical privacy challenge." Medscape Molecular Medicine.1(8):6872.
- Gulcher, J. R. and K. Stefansson (2000). "The Icelandic Healthcare Database and informed consent." New England Journal of Medicine 342(24): 1827-30.
- Gutin, J. (1994). "End of the Rainbow." Discover Magazine(November): 71-75.
- Hodgson, J. (1998). "A genetic heritage betrayed or empowered?" Nature Biotechnology 16: 1017-1021.

- Hood, L. and Lee Rowen. (1997). Genes, Genomes, and Society. Genetic Secrets: Protecting Privacy and Confidentiality in the Genetic Era. M. A. Rothstein. New Haven: Yale University Press. 3-30.
- Human Genome Diversity Committee of HUGO (1993). The Human Genome Diversity Project: Frequently Asked Questions. London, HUGO.
- Human Genome Diversity Committee of HUGO (1993). Human Genome Diversity Project: Summary Document. London, Hugo.
- Indigenous Peoples Coalition Against Biopiracy (1997). The Heart of the Peoples Declaration. Fort Belknap Reservation, MT.
- Juengst, E. T. (1998a). "Groups as Gatekeepers to Genomic Research: Conceptually Confusing, Morally, hazardous, and Practically Useless." Kennedy Institute of Ethics Journal 8(2): 183-200.
- Juengst, E. T. (1998b). "Group identity and human diversity: keeping biology straight from culture." American Journal of Human Genetics 63(3): 673-7.
- Kevles, D. J. (1992). Out of Eugenics: The Historical Politics of the Human Genome. The Code of Codes. D. J. Kevles and L. Hood. Massachusetts: Harvard University Press. 3-36.
- King, P. A. (1992). The Past as Prologue: Race, Class, and Gene Discrimination. Gene Mapping: Using Law and Ethics as Guides. Sherman Elias and George J. Annas. Oxford: Oxford University Press. 94-111.
- Kluckhohn, C. and Dorothea Leighton. (1974). The Navaho. Massachusetts: Harvard University Press.
- Knoppers, B. M., M. Hirtle, et al. (1996). "Ethical issues in international collaborative research on the human genome: the HGP and the HGDP." Genomics 34(2): 272-82.
- Kunitz, S. J. (1983). Disease Change and the Role of Medicine: The Navajo Experience. Berkeley: University of California Press.
- Liloqula, Ruth. (1996). "Value of Life: Saving Genes versus Saving Indigenous Peoples." Cultural Survival Quarterly 20(2): 42-45.
- Lowenstein, J. (1992). "Whose Genome Is It, Anyway?" Discover Magazine(May): 28-31.
- Marks, J. (1995). Human Biodiversity: Genes, Race, and History. New York, Aldine De Gruyter.

- Marshall, E. (1997). "Tapping Iceland's DNA." Science **278**: 566.
- Marshall, P. A. and Barbara A. Koenig. (1996). Bioethics in Anthropology: Perspectives on Culture, Medicine, and Morality. Medical Anthropology: Contemporary Theory and Method. Carolyn F. Sargent and T. M. Johnson. Connecticut: Praeger Press. 349-373.
- McInnis, M.G. (1999). "The Assent of a Nation" Genetics and Iceland." Clinical Genetics **55**(4): 234-239.
- Moore, J. (1996). "Native Americans, Scientists, and the HGDP." Cultural Survival Quarterly **20**(2): 60-63.
- National Bioethics Advisory Commission. (1999). Research Involving Human Biological Materials: Ethical Issues and Policy Guidelines. In Press.
- National Research Council (1997). Evaluating Human Genetic Diversity. Washington D.C, National Academy Press.
- North American Regional Committee of the Human Genome Diversity Project (1997). "Proposed Model Ethical Protocol for Collecting DNA Samples." Houston Law Review **33**: 1431-1473.
- Reilly, P. (1998). "Rethinking Risks to Human Subjects in Genetic Research." American Journal of Human Genetics **63**: 682-685.
- Rural Advancement Foundation International (RAFI) (1997). RAFI Communique-Biopiracy Update: The Inequitable Sharing of Benefits, RAFI.
- Sharp, R. R. and Morris W. Foster. (2000). "Involving Study Populations in the Review of Genetic Research." The Journal of Law, Medicine and Ethics **28**(1): 41-51.
- Trennert, R. A. (1998). White Man's Medicine: Government Doctors and the Navajo, 1863-1955. Albuquerque: University of New Mexico Press.

MICHIGAN STATE UNIVERSITY LIBRARIES



3 1293 02092 7194