

See also: Animal Rights in Research and Research Application; Bioethics: Philosophical Aspects; Ethical Dilemmas: Research and Treatment Priorities; Ethical Issues in the 'New' Genetics; Ethics Committees in Science: European Perspectives; Ethics for Biomedical Research Involving Humans: International Codes; Euthanasia; Genetic Counseling: Historical, Ethical, and Practical Aspects; Genetic Testing and Counseling: Educational and Professional Aspects; Intellectual Property Rights: Ethical Aspects; Pecuniary Issues in Medical Services: Ethical Aspects; Reproductive Medicine: Ethical Aspects; Research: Ethical Aspects of Long-term Responsibilities; Research Ethics, Cross-cultural Dimensions of; Research Subjects, Informed and Implied Consent of; Risk Screening, Testing, and Diagnosis: Ethical Aspects

### Bibliography

- Agar N 1998 Liberal eugenics. *Public Affairs Quarterly* 12, 2(April): 137–55
- Arrington R L 1997 Ethics I (1945 to the present). In: Canfield J V (ed.) *Routledge History of Philosophy Volume X*. Routledge, London
- Beauchamp T L, Childress J F 1994 *Principles of Biomedical Ethics*. Oxford University Press, New York
- Chadwick R (ed.) 1998 *Encyclopedia of Applied Ethics*, 4 Vol. Academic Press, San Diego, CA
- Chadwick R, Shickle D, ten Have H, Wiesing U (eds.) 1999 *The Ethics of Genetic Screening*. Kluwer Academic Publishers, Dordrecht, Germany
- Faden R R, Beauchamp T L 1986 *A History and Theory of Informed Consent*. Oxford University Press, New York
- Frankena W K 1973 *Ethics*. Prentice-Hall, Englewood Cliffs, NJ
- Gethmann C F 1989 Proto-ethics. Towards a formal pragmatics of justificatory discourse. In: Butts R E, Burrichter J R (eds.) *Constructivism and Science. Essays in Recent German Philosophy*. Kluwer Academic Publishers, Dordrecht, Germany
- Harris J 1997 Goodbye Dolly? The ethics of human cloning. *Journal of Medical Ethics* 23: 353–60
- Kuhse H, Singer P (eds.) 1999 *Bioethics. An Anthology*. Blackwell Publishers, Oxford, UK
- Lauritzen P (ed.) 2001 *Cloning and the Future of Human Embryo Research*. Oxford University Press, New York
- Reich W T (ed.) 1995 *Encyclopedia of Bioethics*, 5 Vols. Macmillan, New York
- Singer P 1994 *Rethinking Life & Death*. The Text Publishing Company, Melbourne, Victoria
- Steinbock B, Norcross A (eds.) 1994 *Killing and Letting Die*. Fordham University Press, New York
- Stingl M 1997 Ethics I (1900–45). In: Canfield J V (ed.) *Routledge History of Philosophy Volume X*. Routledge, London
- Sorell T (ed.) 1998 *Health Care, Ethics and Insurance*. Routledge, London
- Tooley M 1972 Abortion and infanticide. *Philosophy and Public Affairs* 2(1): 37–65
- Wilmut I 1998 Cloning for medicine. *Scientific American*, December(12): 58–64

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## Bioethics: Philosophical Aspects

Etymologically, the term 'bioethics' derives from the Greek words *bios* (life) and *ethike* (ethics), and literally means the ethics of life. In practice, however, it denotes a field largely concerned with the ethical analysis of normative problems in the biomedical sciences, medical practices, and health care management. Reflecting this focus, this article addresses the nature and history of bioethics, the dominant ethical theories employed in bioethical reasoning, and their influence in the main areas of bioethical research.

### 1. Bioethics—Scope and History

Bioethics, both as an academic discipline and as a professional activity, has evolved from the domain of medical ethics. It is a multidisciplinary field that extends far beyond the spheres of healthcare and medical ethics. It encompasses a wide range of ethical problems in the life sciences. These include issues related to genetics, theories of human development, behavioral psychology, and resource allocation in healthcare management.

Bioethical expertise is sought by courts, parliaments, research ethics committees, and is used in clinical consultations to guide the behavior of medical professionals. Despite its practical appeal, however, disagreement exists about the nature and scope of bioethics as a professional/theoretical discipline. Bioethicists come from a diverse range of professional backgrounds, including healthcare professions, philosophy, jurisprudence, sociology, and theology. Debate about the proper relations between the disciplines contributing to bioethical analysis is continuing (Carson and Burns 1997).

#### 1.1 Expanding Issues in Medicine

The reasons for the progression of bioethics as a multidisciplinary activity can perhaps best be understood by considering the societal context in which it began. The rapid developments with regard to both the availability of biomedical technology and dramatically advancing biomedical research required a rethinking of traditional approaches to medical ethics. The 1960s saw not only the first successful organ transplantations, the contraceptive pill, and the arrival of prenatal diagnosis, but also a shift to the deployment of highly technological medicine. Particular people began to demand greater liberties, such as equal rights for those who were non-Caucasian, female, and gay. Medical paternalism, and the attitude that the 'doctor knows best' were no longer considered sacrosanct. The Western world saw the progression

towards civil liberties, and changes in the practices of the biomedical sciences began to reflect the modern emphasis on autonomy. Informed consent, the protection of human subjects, and patient self-determination began to assume paramount importance in both theoretical and legal contexts.

### 1.2 Bioethics Teaching

Bioethics is currently taught in many diverse forms throughout both the developed and developing world. Bioethicists teach in medical faculties, medical humanities, and philosophy programs, and in one of several hundred research centers in postgraduate degree programs. The socioeconomic and cultural contexts of teaching influence the topics that constitute a given syllabus. For example, in developing countries, issues such as exploitation in organ transplantation or human experimentation feature more prominently than in developed nations. Teachers try to instill heightened sensitivity in their students to ethical issues and values in medicine, as well as provide them with skills in dealing with ethical problems arising in healthcare practice. Courses are often taken as part of obligatory continuing medical education requirements.

## 2. Theoretical Approaches to Bioethics

Philosophical ethics, the theoretical heart of bioethical analyses, consists of a variety of competing ethical theories. Utilitarians, deontologists, casuists, communitarians, contractarians, virtue ethicists, and ethicists of other persuasions appeal to differing modes of ethical reasoning. This has consequences for bioethical analyses since the type of ethical theory or religious framework to which a given bioethicist subscribes will be reflected in the practical advice advocated.

### 2.1 Principle-based Bioethics

Principle-based bioethics typically refers to an approach developed by Beauchamp and Childress (1994). They propose a system of bioethics comprised of four major principles: autonomy, beneficence, nonmaleficence, and justice. These *prima facie* principles primarily concern respect for the choices people make, the obligation to help, but not harm, other parties, and the requirement to act in a fair and equitable manner with regard to the distribution of medical burdens and benefits. Critics charge that principle-based bioethics is unsuitable for practical decision making because the lack of hierarchical order

of principles renders the ranking in any given situation somewhat arbitrary. Because it is able to be taught in a comprehensive and accessible manner, however, this approach is favored in many bioethics teaching programs.

### 2.2 Utilitarian Bioethics

Utilitarians have developed a consequentialist type of theory, judging the rightness or wrongness of a given action exclusively by its consequences. Of all the ethical theories, utilitarian modes of reasoning are most easily suited to problem solving in bioethics. This is because their guiding principle is singular and unambiguous, providing a clear procedure for decision making. The basic utilitarian premise is that both individual action and public policy should maximize utility (which is normally defined in terms of happiness or preference-satisfaction) for the greatest number of people. Its patterns of analysis are congruent with traditional forms of reasoning in public policy. Utilitarians have contributed sophisticated works to central problems in bioethics, such as abortion, voluntary euthanasia, embryo experimentation, and resource allocation.

Critics of utilitarianism doubt that it is possible to quantify interest or preference satisfaction, and question the feasibility of the utilitarian calculus as a decision directive. Also controversial is the utilitarian rejection of two distinctions which are central to other approaches in medical ethics: the intention/foresight and acts/omissions distinctions. These distinctions are important in terms of motives and responsibilities for action, both of which utilitarians ignore, focusing exclusively on consequences as criteria of right action.

### 2.3 Deontological Bioethics

Secular deontological approaches to bioethics tend to be based on Kantian and neo-Kantian ethical theories, and feature most prominently in the areas of resource allocation and general social health policy. Daniels (1985), for example, uses a neo-Kantian form of contractarianism to support his influential argument for a universal right to healthcare. The Kantian moral agent is quite different from the utilitarian agent who acts in order to satisfy interests or desires.

Kant was concerned with the motivation of action, and argued that duty alone should motivate morally adequate action. An 'action done from duty has its moral worth not in the purpose to be attained by it, but in the maxim in accordance with which it is decided upon' (Kant 1976). These maxims are constructed as absolute imperatives of the sort, 'don't kill,' 'don't lie,' etc. Furthermore, Kant developed

Categorical Imperatives, the most influential of which demands that the moral agent never treat other people as mere means to ends (however noble these may be), but rather as ends in themselves.

There are some reasonably clear differences between Kantian and utilitarian bioethical decision making. Utilitarians and Kantians arrive at very different answers to the question of whether it is ethically justifiable to kill one 'innocent' human being in order to save 10 similar others who are in need of organ transplants. All other things being equal, utilitarians would conclude that it is right to kill one person to save the lives of 10 others, while a Kantian would argue that it is unacceptable to kill an innocent person. Kantians are not concerned about the consequences of action, but rather with the question of whether one can consistently wish to be treated by other rational agents in the same manner as one desires to act in a comparable situation. Kantian bioethicists tend to defend absolutist positions, such as the rejection of voluntary euthanasia, irrespective of the suffering this may cause.

#### 2.4 Feminist Bioethics

Feminist approaches to bioethics are unified by a common concern for women's oppression. Feminist bioethics raises the question of unequal distribution of social power, and the subsequent biases that manifest in the life sciences, medical practices, and philosophical ethics. There are numerous feminist approaches to these fields. Feminist projects provide a critique of traditional approaches to bioethics, focusing on the effects that the historical exclusion of women and their experiences have had on theory production. Some feminists aim merely to provide a *corrective* to dominant theories and practices, while others embark on the more radical project of creating positive feminist theories and practices which differ *fundamentally* from those which are the objects of critique. Whether one stops at critique, or progresses to creating novel theories founded on new premises, depends largely on how deep the level of masculine bias is held to be. Bioethics provides fertile ground for feminist analysis, since scientific claims have long been used as tools to justify women's oppression as part of the natural order of things. Feminist interactions with the sciences aim to expose the value-laden nature of scientific practices; how our social context effects the sort of questions asked, the methodologies employed, and the sort of answers that are considered coherent. Feminists have been central to debates on abortion and reproductive technologies. The scope of feminist argument is not, however, limited to those domains explicitly related to women; it spans the entire field of bioethics. Some theorists have demanded that feminist theory also consider the ways in which race, ethnicity, and class bear upon theory construction. For these reasons,

many feminists reject the goal of one universal moral theory in favor of a more pluralistic approach to knowledges and their application.

Commonly, feminists take issue with the *sort* of human agent that moral theory assumes. Specifically, it is argued that certain features of this subject (i.e., its participation in an alleged objective, universal human Reason) reflect a mode of reasoning which depends on the exclusion/devaluation of women's experiences. Contemporary models of moral reasoning drawn from experiences in the private sphere (such as mothering, caring for the aged, and preparing and distributing food) are substantially different from those based on hitherto ignored experiences common to the public arena, which has historically been the domain of men. Indeed, care- (Gilligan 1982, Noddings 1984) and maternal- (Ruddick 1995, Held 1993) based are perhaps the main challenges to traditional moral theory produced by Anglo-American feminists. From a utilitarian perspective, their implications have been most thoroughly explored in the domain of nursing (Kuhse 1997).

#### 2.5 Communitarian Bioethics

In the context of bioethics, communitarianism constitutes a critical discourse that challenges dominant approaches which are based on Enlightenment philosophies. The idea of an isolated knowing subject, who defines ethical truth in accordance with the dictates of human reason, is rejected. Communitarians privilege the interests and values *of the community* in negotiating morally optimal courses of action. They argue that any moral theory is determined by socio-historical context, including the traditions, religions, and culture of a community. Within traditional moral theories, these influences are often seen as extraneous, contaminating the goal of objective moral truth. For communitarians, however, attempts to produce an impartial, universal moral theory are not only futile, but represent a mistaken concept of what moral thought *should* involve. They emphasize that certain decisions require a view of the good, of what is worthwhile and valuable for a community.

The goal of defining goods and values that are genuinely shared by any given community is problematic. In increasingly multicultural societies and global communities, identifying shared conceptions of the moral good might only be possible if communities are defined in a narrow sense, resulting in many communities with perhaps competing views of the good life.

#### 2.6 Religious Bioethics

Religious ethics is not a unified ethical theory, like Kantianism. Religious ethical analyses will always

depend on the particular religious scripture that guides the ethicist. Monotheistic religions are traditionally less open-minded with regard to pluralistic views that might be held in secular societies. Still, even within Christianity and Judaism, there is a range of diverse views held by bioethics scholars. Catholic bioethicists tend to be in strict agreement with the teachings of their organization. This is largely due to the fact that Catholicism is the only mainstream religion that has a body of papal *ex cathedra* teaching. Even here, however, the Biblical commandment 'thou shalt not kill' has undergone some theological reinterpretation. Despite this, there is unanimity among Catholic scholars that active euthanasia and abortion are ethically unacceptable. In many countries, Islamic medical associations have produced their own code of ethical conduct.

### 3. *Issues in Bioethics*

#### 3.1 *Research Ethics*

Research ethics came about largely because of revelations regarding the gruesome medical experiments conducted by Nazi doctors in German concentration camps during the Third Reich. The most important international normative framework regulating the standards of research clinical trials is the Declaration of Helsinki (WMA [World Medical Association] 1964). In 1993, it was supplemented by international research ethics guidelines produced by the CIOMS (Council of Medical Organisations of Medical Sciences) in collaboration with the WHO (World Health Organisation). This set of documents contains a series of important protections for people participating as research subjects. These are especially important for people in developing countries, where exploitative trials continue to take place. Bioethical analyses of research ask questions such as the following:

- (a) Ought researchers be held responsible for the use of their research results by other parties?
- (b) What is the appropriate point in time to stop research clinical trials?
- (c) Are placebo controls defensible in trials with terminally ill patients?
- (d) Are terminally ill patients justified in breaking protocols in placebo controlled trials, given that many only joined the trial in order to access the experimental agent (Schüklenk 1998)?
- (e) Ought women of childbearing age be enrolled in research clinical trials?
- (f) Ought prisoners be asked to participate in nontherapeutic research?

A key issue in research ethics is informed consent, which is considered a precondition for any ethical research, given that it is voluntary and autonomous.

Justifications for this premise derive from the idea that individual autonomy is of intrinsic and/or instrumental value. Neo-Kantians argue that autonomy is of great intrinsic value. Young (1986), for example, understands the value of autonomy as a character ideal, rather than as a means to some further good. Utilitarians also support the idea of respect for informed consent because they, too, value personal autonomy. In this instance, personal autonomy is of instrumental value, necessary to satisfy one's own preferences, desires, and interests. Research ethics protections and standards pertaining to research subjects in developing countries are also issues of paramount importance. AIDS research in particular has led to large numbers of international collaborative research projects. International research ethics guidelines require that every patient (including those in any control group) should be assured of access to the best proven diagnosis and therapeutic method. This requirement was designed to prevent the exploitation of research subjects in developing countries who participate in projects undertaken by Western researchers. Some bioethicists have argued that the enforcement of Western norms in developing countries constitutes cultural imperialism. Utilitarians are most likely to inquire after the consequences of accepting a lower standard of care for research subjects in developing countries. If such a strategy would lead to the development of cheaper, perhaps affordable, drugs for people living in developing nations, utilitarians would accept such a policy change.

Deontologists argue that the primary obligation of physicians is to their research subjects and not to future generations of patients. This makes them more ideal advocates of current research subjects' interests, as opposed to utilitarians who would have to take into account the interests of all concerned, including those of future generations. Principalists would have to balance the duties of nonmaleficence and beneficence against each other in this case. They suggest that we have an absolute duty not to harm anyone, but that we have no absolute duty to do good. This view could be used to justify providing local standards of care in international collaborative research efforts, because providing the highest attainable standards of care would require providing more than what is already available. This is arguably doing good over and above the call of duty.

#### 3.2 *Beginning and End of Life*

The moral status of embryos, fetuses, and infants continues to dominate beginning of life debates. Some ethicists suggest that fetuses deserve moral standing and consideration by virtue of their belonging to the human species. Others reject this proposal as speciesist, arguing that the mere fact of being human does not give fetuses special status (Singer 1990).

Rather, their moral standing ought to depend on their dispositional capacities.

The debates about the moral status of embryos and fetuses primarily affect issues surrounding new reproductive technologies and abortion.

Catholic bioethicists hold that nothing can justify the killing of innocent human beings, irrespective of whether they are fetuses, infants, adults, or people suffering from terminal illnesses. Abortion is considered unethical, even when the mother's life is at stake (Sacred Congregation for the Doctrine of Faith 1980). These bioethicists argue that fetuses are human beings from conception, and ought to be accorded the same moral entitlements to life as other humans. In turn, embryo experimentation is also deemed unacceptable. This view is often supported by deontological ethicists who propose an absolute sanctity of all life. The vast majority of feminists support (and have been crucial in creating and maintaining) the legal right to abortion on the basis of the mother's interest in/right to bodily autonomy and integrity. This interest/right is often seen as overriding any moral status that the fetus might have. Feminists have also argued that maternal-fetal conflict models inaccurately characterize what is at stake in pregnant women's decisions which affect their fetus, and alternate models which do not centralize conflict have been proposed.

Bioethical debates concerning the end of life tend to be preoccupied with the permissibility of physician-assisted suicide and voluntary euthanasia. Many people suffering from terminal illnesses find their quality of life during their last months of life so unbearable that they ask physicians to help them die, either by means of supplying them with lethal doses of drugs, or by killing them actively. The Hippocratic Oath requires doctors to 'neither give a deadly drug to anyone if asked for it, nor make a suggestion to this effect.' Accordingly, medical ethics has traditionally seen doctors' assistance in patients' attempts to die as incompatible with their roles as lifesavers. The sanctity-of-life doctrine in medicine, strongly influenced by religious views, rejects the view that some lives might be so bad that they are not worth living. Utilitarians argue that we ought to abandon the sanctity of life doctrine and substitute it with a quality of life ethics instead (Kuhse 1987).

### 3.3 The 'New Genetics'

Molecular genetics, and its associated research and engineering techniques, are often called the 'new genetics.' This field facilitates the manipulation of living organisms to a hitherto unimaginable degree. We are able to clone animals, research treatments of diseases with both somatic and germ-line gene therapy, select animal and human embryos and fetuses on the basis of their genotype, create microorganisms of

desired genotypes, and have them, as well as plants, express both human and animal genes which code for desired protein products. Questions such as the following are now widely debated:

(a) Is reproductive/therapeutic *human* cloning morally acceptable?

(b) Does selecting against people with disease genes through prenatal screening constitute discrimination?

(c) Can we define disease genes in morally neutral ways?

(d) Does the desire for positive human traits such as physical beauty or intelligence justify the selective abortion of fetuses with 'suboptimal' genotypes?

(e) What ecological effects are likely as we cross species barriers by creating hybrid organisms?

(f) How can we control the creation of genetically engineered pathogens tailored for particular human populations in the service of military or terrorists' agendas?

Human society remains deeply troubled by genocidal wars, and discrimination against people on the basis of race, ethnicity, sex, and sexual orientation is rife. The identification of genetic markers of marginalization opens new possibilities for eugenic programs, racial 'cleansing,' and genetically targeted biological warfare. It is thus clear that the 'new genetics' may be used for malign purposes as well as for the good of humanity. An example of the ways in which the application of moral theories to genetics differs can be found in discussions of prenatal testing and subsequent selective abortion for nonmedical reasons. What constitutes a *medical* reason is itself open to debate, and the question of whether abortion, based on the presence of, say, a gene predisposing to late-onset cancer, is justified, is far from settled. Screening and abortion for nonmedical reasons are far more controversial. A dominant utilitarian approach to this issue would look to individual preferences, and would be likely to endorse a liberal approach, where uptake of such technology would be a matter of individual choice. For as long as fetuses are not considered entities either with interests able to outweigh those of parents, or with the capacity to suffer significantly, there would be no reason against the provision of selective abortion. The only utilitarian argument against such technology would be one which held that the indirect consequences for society in general would be so detrimental that they outweighed the direct preferences of potential users.

A deontologist's approach might oppose the provision of prenatal screening in order to facilitate selective abortion for nonmedical reasons. Motives for action are crucial for a deontologist. Deontologists emphasize respect for human dignity, which entails that all people be treated equally, and that they not be used merely as means to another's ends, but rather, always as ends in themselves. It is possible that abortion *per se* would be opposed on the basis of respect for human potentiality. Differentiating be-

tween people on the basis of sex or hair/eye color would be incompatible with respect for human dignity, and associated selective abortion would certainly be a case of using a potential person for another's, perhaps trivial, ends (Davis 1997).

A liberal feminist bioethicist's response might endorse eugenic technology in accordance with respect for a woman's right to autonomy, and control over the pregnancies with which she chooses to continue (Warren 1985). Feminists would also be concerned with the social conditions in which technology is developed, and the demand for its provision generated. Attentive to the ways in which science might work in the interests of the dominant sex, race, and class, any technology which facilitates discrimination against these markers of marginalization would be viewed with suspicion. Thus, prenatal testing for sex might not be supported in societies where there is entrenched oppression/devaluation of women, and a concomitant preference for male children.

### *3.4 Healthcare Professional–Patient Relationship*

Some writers suggest that the relationship between healthcare professionals (HCPs) and patients is best understood as a contractual agreement, similar to that between a customer and a professional selling service. A contract usually includes protections to the partners such that if the contract is broken by one party (i.e., by providing substandard treatments, or by not paying the due fee), legal recourse can be sought by the wronged other. The advantage of this model is that it breaks with authoritarian models of the physician. Instead it requires respect for the patient's autonomy, usually first-person voluntary informed consent to treatment, and agreement between doctors and patients about a proposed course of action. It has been proposed that medical practice ought to rely on a covenant model instead of the code-based model that it tends to rely on in actuality (May 1975). Others have seen doctors' service provision and associated medical paternalism as an extension of their professional duty of beneficence (Downie 1994). This traditional attitude has been challenged by claims of patients' rights to medical care and doctors' obligations to satisfy these rights.

US bioethicists have attempted to address ethical concerns of the HCP–patient relationship in the context of the principle-based approach. This strategy turned out to be quite problematic because of the conflicts between simultaneously having to respect autonomy, act beneficently, and act justly.

Utilitarians defend upholding patient confidentiality by pointing to the negative consequences for the physician–patient relationship once patients cannot trust that their medical details will be kept confidential. They suggest that maintaining patient confidentiality

is necessary for achieving the health and well-being of patients. Deontologists support this conclusion on the basis of a distinctly different rationale. They argue that respect for patient autonomy requires that patients keep control over what type of intimate, private information is available to parties other than those to whom they disclose it.

### *3.5 Resource Allocation*

Determining the optimal means of allocating scarce resources for healthcare is an intractable problem requiring constant negotiation as new technologies and treatments become available. While the UN Declaration of Human Rights states that every person 'has the right to a standard of living adequate for the health and well-being of himself (sic);' defining the criteria of such adequacy is open to debate. As is the case with any limited resource, there are always situations in which the number of people desirous of a particular form of healthcare outweighs what is available. On a macrolevel, decisions must be made regarding the extent to which healthcare should be state-funded, and the way in which such provisions should be distributed between medical research programs, available treatments, and technologies. On a microlevel, medical staff must confront issues such as how to allocate hospital beds, order of, and eligibility for, treatments. Prominent criteria for resource allocation decisions are need, merit, desert, order of demand, social utility, and expected benefit from treatment. Some theorists suggest that it is only when consensus about degree of need cannot be reached that other factors come into play (Harris 1998). Where a maximizing strategy is endorsed, however, it is largely the consequences of treatment that matter, and medical need is not necessarily the primary criterion. Resolving some way of considering these issues is particularly pertinent in the face of an aging population, where healthcare becomes increasingly expensive, and quality of life considerations become pressing. For example, how should funding be distributed between geriatric and newborn-infant care?

Callahan (1990) argues that this question is necessarily linked to the goals of the community. A communitarian approach might articulate the goals of medicine in terms of particular stages of the life cycle, while also thinking about what the goals and virtues of the elderly should be. This entails the possibility that elderly persons might be morally required to forego certain life-prolonging treatments in the interests of providing healthcare for younger generations. A utilitarian method uses quality adjusted life years (QALYs) in order to help determine who has most claim on limited treatments. QALYs provide a means of calculating which individuals, with treatment, can expect to live the longest, where the number of years

are adjusted for quality. Thus a person predicted to live 10 *actual* years after treatment with a very low quality of life would have less than 10 QALY years to live, and would lose out to a patient predicted to live, say, eight actual years with a good quality of life. Similarly, if we imagine an elderly person and a youth, both in need of an organ transplant, and both with similar qualities of life expected postoperation, it is clear that the QALY method would favor the young person. A utilitarian may, of course, choose to include other factors beside QALYs in their calculation of who should get the organ. If the elderly person had, say, a large number of refugees dependant on them for survival, then this may count as a compelling reason to favor their receipt of the organ. Nonetheless, whether or not the initial favoring of youth amounts to ageism is debatable. Indeed, whether or not the QALY method discriminates against disabled people is also questionable, since mental/physical disabilities are generally assumed to reduce quality of life. Any method of assessing quality of life remains controversial. Some argue that quality of life is a subjective concept which can only be meaningfully assessed by the individuals in question. Other theorists who maintain that quality of life can be judged objectively disagree over the relevant criteria in such a decision. Thus it has been suggested that some measure of both subjective and objective evaluations are needed in order to measure health states (Wikler and Marchland 1998).

*See also:* Consequentialism Including Utilitarianism; Ethical Codes, Professional: Business Codes; Ethics and Values; Rights

### Bibliography

- Beauchamp T L, Childress J F 1994 *Principles of Biomedical Ethics*. Oxford University Press, New York
- Callahan D 1990 *What Kind of Life?* Simon and Schuster: New York
- Carson R A, Burns C R (eds.) 1997 *Philosophy of Medicine and Bioethics: a Twenty-Year Retrospective and Critical Appraisal*. Kluwer, Dordrecht, The Netherlands
- Daniels N 1985 *Just Health Care*. Cambridge University Press, Cambridge, UK
- Davis D S 1997 Genetic dilemmas and the child's right to an open future. *Hastings Center Report* 27(2): 7–15
- Downie R S 1994 The doctor–patient relationship. In: Gillon R (ed.) *Healthcare Ethics*. Wiley, Chichester, UK, pp. 343–7
- Gilligan C 1982 *In a Different Voice*. Harvard University Press, Cambridge, MA
- Harris J 1998 Micro-allocation: deciding between patients. In: Kuhse H, Singer P (eds.) *A Companion to Bioethics*. Blackwell Publishers, Oxford, UK
- Held V 1993 *Feminist Morality: Transforming Culture, Society and Politics*. University of Chicago Press, Chicago
- Kant I 1976 *Critique of Practical Reason*. Garland, New York, pp. 67–8
- Kuhse H 1987 *The Sanctity-of-Life Doctrine in Medicine*. Oxford University Press, Oxford, UK

- Kuhse H 1997 *Caring: Nurses, Women and Ethics*. Blackwell, Oxford, UK
- May W F 1975 Code, covenant, contract, or philanthropy. *Hastings Center Report* 5(6): 29–3
- Noddings N 1984 *Caring: a Feminine Approach to Ethics & Moral Education*. University of California Press, Berkeley, CA
- Ruddick S 1995 *Maternal Thinking: Towards a Politics of Peace*. Beacon Press, Boston, MA
- Schüklenk U 1998 *Access to Experimental Drugs in Terminal Illness: Ethical Issues*. Pharmaceutical Products Press, New York
- Sacred Congregation for the Doctrine of Faith 1980 *Declaration on Euthanasia*. Vatican City, Rome
- Singer P 1990 *Animal Liberation*. Review of Books, New York
- Steinbock B 1998 Mother–fetus conflict. In: Kuhse H, Singer P (eds.) *A Companion to Bioethics*. Blackwell, Oxford, UK, pp. 135–46
- Warren M A 1985 The ethics of sex preselection. In: Humber J, Almeder R (eds.) *Biomedical Ethics Reviews*. Humana Press, Clifton, NJ
- Wikler D, Marchland S 1998 Macro-allocation: dividing up the health care budget. In: Kuhse H, Singer P (eds.) *A Companion to Bioethics*. Blackwell, Oxford, UK
- World Medical Association 1964 Declaration of Helsinki. In: Jansen A R, Veatch R M, Walters L (eds.) *1998 Source Book in Bioethics*. Georgetown University Press, Washington, DC, pp. 13–15
- Young R 1986 *Personal Autonomy: Beyond Negative and Positive Liberty*. St. Martin's Press, New York

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## Biogeography

Biogeography is not easy to be defined precisely and this is for several reasons. Some scientists think that biogeography is a biological discipline, firmly rooted in nothing but the biological sciences. Biogeography, or the two common subdivisions phytogeography and zoogeography, is the field for studying the distribution of plants and animals, respectively. Due especially to the higher diversity and the greater mobility of animals, zoogeography has developed less than plant geography. Moreover, plants are more directly affected by their physical habitat and exert at the same time a greater influence on climatic and edaphic properties than animals. They better indicate visibly the environmental condition they live in.

On the other hand, many geographers claim biogeography to be a geographical discipline and regard it as a most important link between physical and human geography, because man's effects on plants and animals are included. They stick firmly to the ecosystem concept and regard biogeography as a vital part of ecological geography or geoecology. And they underline the often neglected meaning of scales in time and space as well as the dynamics of the ecosystems.

The struggle between biologists, who prefer a more

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