

HEALTH ETHICS, EQUITY AND HUMAN DIGNITY

© Mamdouh Gabr

Professor of Pediatrics, Faculty of Medicine, Cairo University, Egypt

Keywords: equity, health ethics, global health, health determinates, human rights, human dignity, futures

Contents

[1. Introduction.](#)

[2. Definitions and Concept](#)

[3. Ethics and Major Determinants of Health](#)

[4. Future Oriented Approach](#)

[Related Chapters](#)

[Bibliography](#)

[Biographical Sketch](#)

Summary

Ethics in health evolved through several phases during the last few decades; traditional ethics, bioethics, health policy ethics and ethics in relation to human rights. Equity which has to do with a fair distribution of benefits from health and social development is defined in various ways. There are two views on achieving equity, the solidarity approach and the individual right approach. The last can only be achieved in wealthy politically stable communities. A balance has to be established between the two approaches. With the promotion of human rights gaining momentum in recent years; there is a need to review ethical principles in health to ensure that human rights and dignity are fully respected. The health sector has the obligation of considering the ethical dimensions of the major determinants of health. These include the political system, economic situation, demographic changes, cultural diversity, role of women, global ecosystem sustainability, technological advances and the changing pattern of disease. As we start the third millennium, social mobilization in support of health ethics, equity and human dignity is a responsibility of the academic and advocacy groups involved in ethics and human rights. An ethical culture should be developed at the national level.

Institutionalization of health ethics is required. New, sensitive, reliable indicators and a vigilance system to monitor inequalities in health care, and abuse or neglect of human rights are to be developed. This can be achieved through innovative research and

fostering international cooperation. It is hoped that the twenty-first century will be characterized by wisdom with which acquired knowledge will be applied with equity.

1. Introduction

Health ethics evolved into four phases during the last few decades. Traditional ethics, which mainly prevailed until the sixties, involved the relationship between the health care provider and the patient, and was dominated by the Hippocratic culture which had provided it with a core of values for more than 2000 years.

Advances in bio-sciences and biotechnology, such as organ transplantation, genetics, and molecular biology, introduced an additional ethical dimension usually referred to as bioethics.

The democratization and market liberalization which swept the world resulted in an increasing cost of health services. A new ethical dilemma developed because of the growing gap between health needs and available health resources. The concept of health ethics was broadened to what is sometimes referred to as "health policy ethics". This would cover such issues as health policy priorities, cost effectiveness, coverage, quality, delivery and research. Ethics moved from being a personal matter limited to the satisfaction or dissatisfaction of the individual to a social matter dealing with the mental and social well being of the people.

As we move into the twenty-first century, the promotion and protection of human rights is gaining greater momentum. "The enjoyment of the highest standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition," stated the WHO constitution in 1946. It is relatively recent that the implications of this statement on ethics and equity in health care have been receiving more support.

The dual relationship between human rights and the right to health will impose a fourth dimension on our interpretation of health ethics.

2. Definitions and Concepts

While the definition of health is well established in the WHO constitution as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity," the definitions of ethics, equity and human dignity tend to be more complex.

2.1. Ethics

Ethics is grounded on socio-cultural, philosophical or religious convictions of what is good or evil. Ethics is considered as the effort to find justifiable grounds for distinguishing what is right or wrong in human actions and ways of life. Ethics incorporates social dimensions; it is concerned with justice, rights, respect of human dignity, autonomy of the individual and respect of the community. Health policy ethics is

concerned with organization financing and delivering health care.

In this respect, ethics is a bridge between health policy and values, where values are recognized as guides and justifications people use for choosing goals, priorities and measures. Ethics examines the moral validity of the choice.

2.2. Equity

Equity is frequently defined as an expression of social justice. It has to do fundamentally with a fair distribution of benefits from health and social development. It goes beyond equality of access to health care. It calls for responses that are in accord with the needs of the individual in relation to the needs for all. From the point of view of health, equity can be defined in various ways:

- a.) equal resources expended for each individual (supply equity);
- b.) equal resources expended for each case of a particular condition;
- c.) equal access to health services;
- d.) equal quality of health care;
- e.) equal status of health for all (which is eutopic);
- f.) equal healthy life gained per dollar expended;
- g.) care according to needs (demand equity).

Equity involves both process and outcome. An operational approach would be to assess the impact of specific health decisions on equity and to ensure that decisions taken do enhance equity.

One view of equity focuses on the health of the most vulnerable. However, the definition of the vulnerables is not clear. Are they the most sick, the most socially deprived or a group in a certain population such as women, children or the elderly? A distinction is usually made between those who are inherently vulnerable (such as those with a congenital disability) or those whose vulnerability is a result of social construct (such as the poor, women in certain cultures, etc.). An overlap might exist. As an example, the deaf, whose inherent vulnerability renders them powerless, are excluded through the social construct from being involved in decisions or resource allocations even if related to their disability, such as cochlear implantation. Ideally, health inequities contingent on factors such as gender, age, residence, education, income, ethnic group, family size, etc. are unacceptable.

It is difficult to judge equity by its impact on national health indicators per se or on cost effectiveness of a certain health intervention on the community. Equity might not have a

direct relation to aggregate health indicators. Improvement on national health statistics can be achieved without improving equity, and dramatic gains in equity can occur without having an impact on aggregate national health statistics. Because of the various determinants affecting health outside the health sector, a cost-effective approach to health ethics may be biased. The cost of supplying basic infra-structure such as housing, clean water, sanitation or transportation to deprived remote areas cannot be included in the cost-effectiveness of a specific health intervention.

There are two views on achieving equity. One is the "solidarity approach", which focuses on the society as a whole but may ignore or subjugate the needs of some members or groups. The opposite extreme to this approach is "the individual right approach" according to which each individual should have equal access to health care and equal outcome. It is obvious that this can only be achieved in a wealthy, politically stable community. Most third-world countries, which suffer the greatest burdens of disease, cannot fulfill these criteria. Sometimes the right of the individual to attain the highest state of health in a poor country would lead to inequities through exhausting the limited resources available for health in highly expensive health interventions. A balance has to be established where priority is given to support the basic health needs for the community. If the language of human rights were to be strictly adhered to in developing countries, it would set the good of the individual against the good of the whole community. The tension even exists in one of the richest countries, USA, where Lawrence Gostin notes that: "although public health authorities assuredly are empowered to constrain the freedoms and rights of individuals if necessary to achieve a collective good, they must do so consistent with constitutional constraints on government action. Achieving a just balance between the powers and duties of the state to defend and advance the public health and legally protected rights of human beings represents an enduring interest of those immersed in the discipline of public health law".

2.3. Human Rights and Human Dignity

Promotion of human rights was identified as a core principle of the UN charter. The Universal Declaration of Human Rights adopted in 1948 states that all people are "free and equal in dignity and rights". Several international treaties, declarations and conventions followed; the convention against racial discrimination (1969); the convention for elimination of all forms of discrimination against women (1981); the convention on the rights of the child (1989), etc.

The promotion and protection of human rights and of health care are fundamentally linked. The right of the individual to receive correct information facilitated legalizing the compulsory information labels on cigarettes resulting in a positive health and economic impact. There has been a growing tendency in recent years to minimize the burden of public health care on individual human rights. In the past, notification, quarantine, isolation, mandatory, testing, etc. were justified on the grounds of limiting the rights of the few for the good of the many. This is no longer ethically acceptable in many cases. The AIDS epidemic is an example where UN policy supports and prevents discrimination against HIV infected people.

Human dignity is considered along with human rights to be inherent, inalienable and universal. While important dignity-related health impacts may include such problems as the poor health status of indigenous peoples, a coherent framework of human dignity violations in the field of health is lacking. A taxonomy and an epidemiology of dignity may uncover an enormous field of previously suspected yet thus far unnamed and therefore undocumented damage to physical, mental and social well-being. The relationship between scientific advances, ethics and human dignity will continue to be a focus for discussion and recommendations throughout the next few decades. As far back as 1993, the World Conference on Human Rights in Vienna noted that certain advances, notably in the biomedical and life sciences as well as in information technology, may have potentially adverse consequences for the integrity, dignity and human rights of the individual, and called for international cooperation to ensure that human rights and dignity are fully respected in this area of universal concern.

3. Ethics and Major Determinants of Health

The health sector has an obligation to consider the ethical implications of the major determinants of health, since causes for inequity or violation of human dignity may originate from outside the health sector. Major determinants include the political system, economic factors, demographic changes, cultural diversity including the role of women, global ecosystem sustainability, technological advances and as a consequence the changing pattern of disease.

3.1. Political system

Democratization is a prerequisite to ensure the respect of human rights, social justice and equity. As we enter the third millennium the process of democratization is spreading to more and more countries. The progress, however, is relatively slow. Progress in health ethics to achieve equity and respect human dignity should not wait. Attempts to achieve equity in health care are usually welcomed even by the most authoritative regimes. Decision makers play a decisive role in adopting ethical principles in health care that ensure equity, justice and respect for human beings. It is the responsibility of professionals, academicians, as well as ethical, human rights and consumer protection groups to supply decision makers with valid, reliable data on the merits of adopting an ethical code of health care that ensures equity and justice. It is not comprehensible that environmental groups (green parties) could be successful, even in third world countries, in mobilizing public opinion and in getting political support; while health ethics groups still lack a strong political lobby to support their humanitarian goals.

Political instability is a great impediment in achieving health for all in certain third world countries. It is estimated that more than 10 million lives were lost as a result of armed conflicts during the last decade of the twentieth century, mostly those of civilians, and mainly children. There are more than 50 million refugees worldwide in need of an equitable share in health care. If the human burden of natural disasters is added to these figures, the challenge of delivering proper health care to those people is staggering.

3.2. Economic factors

The relationship between health and poverty is well established. Ill health drags the poor deeper into poverty and poverty increases the risk of ill health. Exceptions are known; examples are Sri Lanka, Costa Rica, Cuba and other countries where leadership support and proper distribution of health care facilities have partially overcome economic constraint. At the global level, however, the situation is more serious. The income disparity between the richest 20% and the poorest 20% is increasing. It is estimated that more than 1.6 billion people living in more than 100 countries are worse-off today than they were twenty years ago. The enormous imbalance in the distribution of wealth has to be addressed, not only across countries but also between individuals in the same country.

The modern concept of health care reform through privatization theoretically imposes health care expenditure on those who can afford it, leaving more resources for the health care of the poor. In reality this is not easily achieved in low-income countries. It deprives a sector of the population of public health services while their income does not allow them to pay the costs of the private or insurance sector. Furthermore, the quality of public health care may deteriorate when health professionals become engaged in part-time private practice to compensate for their low salary scale. Health care cannot be freely commercialized. Can we allow someone, because of poverty, to sell his kidney to some rich person in need?

The poor are more vulnerable to certain health risks -- occupational or environmental -- as well as to communicable diseases and diseases related to malnutrition. They are also the last to enjoy their rights that might lead to better health. How can people be responsible and accountable for their health when they have little or no control over their living conditions? Their principle preoccupation is likely not to be health but mere survival. Combating poverty and maldistribution of income is not an easy task that will be accomplished in the foreseeable future. However, an ethical and committed approach to ensuring equity in health care would show we mean business.

3.3. Demographic Changes

The population explosion will continue in many third-world countries during the first few decades of the twenty-first century. The global population quadrupled during the last century from 1.6 billion in 1900 to 6.4 billion in 2000. Most of the increase was in developing countries. The percentage of dependant population (children, youth, women, elderly and unemployed) constitute more than 70 % of the population in these counties. Most of them suffer from inequities in health care.

Trends towards urbanization will continue in the third world with an increase of shantytowns, squatter communities and slum areas. These represent 20% of the population of certain third-world mega-cities. It is now recognized that the health of urban slum dwellers is even worse than that of those living in remote rural areas, because of overcrowding, and lack of proper sanitation and easily accessible health care facilities.

They also suffer from particular health threats -- violence, drugs, sexually transmitted diseases and psychiatric problems. A special approach to ensure that proper health care covers these populations is both an ethical and equity issue.

Developing countries where overpopulation control measures are in effect are facing another demographic problem; the rising numbers of elderly people. This, coupled with the increasingly expensive healthcare that is available to the elderly is a major challenge to equity in matters of health.

3.4. Cultural Diversity

The debate about whether ethical principles are universal or diverse and capable of being modified according to prevailing situations has been going on for some time and will probably continue for several decades. It is hoped that globalization will succeed in bridging the gap between different cultures.

Cultures, however, including traditions, customs, and religious beliefs, have been deeply rooted in the people for several centuries. The basic principles of ethics are relevant to all but some degree of flexibility in applying them might be required in certain situations. As the late Professor Osontukon from Nigeria noted, "There is a minima of guidelines below which no-one is allowed to fall but above which diversity can be accepted."

Along the same principle, notions of equity must be understood and expressed in terms of the culture concerned. This is necessary for the promotion of sustainable beneficial change as well as to avoid the so-called "moral imperialism". The term "ethical imperialism" was given to the imposition on one society of solutions culturally appropriate to another society on the pretext that they represent ethical absolutes. Certainly no single country has the right to set universal standards with which other countries must comply.

However, there is an irreducible set of international ethical standards common to all societies which have to be respected.

Let us consider a few examples of the influence of cultural diversity on health ethics. In Japan the human being is a person related to nature and to other human beings. The focus of relationships is more on interdependence than on independence; the family unit is the basis, and too much independence is not much appreciated. The consequences of this interpretation of such ethical principles as confidentiality, personal rights etc. are obvious. In sub-Saharan Africa, human life and health are believed to be under the influence of gods and/or ancestors whose spirits are alive and watchful over their activities. Even when a health condition has a clear-cut physical character, such as an injury, god or spirit may be considered as the remote cause. Traditional therapeutic measures often carried out by medicine men or women in these communities depend on secrecy and privacy. How can the ethical concept of sharing information with the patient be exercised in such a culture? In certain nomadic tribes the welfare of the tribe takes precedence over the well-being of an individual. When certain tribes have to move they are said to leave the sick

members, young or old, behind. Can this be morally acceptable? Anthropologists should be included in the health ethic groups to advise on these diversities.

With globalization and advances in communication and transportation, changes in life-style affecting health are sweeping the world. The ethical implications of these changes have not received the same attention as the ethical implications of the scientific advances for which bioethical codes are being formulated. The concept of health ethics should be broadened to include the dimension of changing life-styles. Ethically, populations should be made aware of the dangers of changing food habits and other patterns of life-style for their health.

Ethical guidelines regarding life-style should be propagated through mass media programs including press, radio and television, taking into consideration existing cultures, traditions and values.

The problem of the treatment of women cannot be underestimated when we consider health ethics, equity, human dignity and cultural diversity. In many cultures even in industrialized countries, women receive less education, less health care and are less involved in decision making at the family, community or national level than men. In traditional conservative cultures a woman cannot commit herself to an informed consent unless she takes permission from her husband. In many African countries where AIDS is prevalent, a woman cannot refuse an unsafe sexual relationship with her husband who is infected with AIDS without escaping his punishment. In many conservative countries a woman cannot use family planning methods without her husbands approval. These are examples of cultural issues related to womens health, which exist in spite of the UN convention on elimination of all forms of discrimination against women. They challenge our principles on ethics, equity and human dignity and need more studies on innovative approaches as well as on supporting existing efforts to empower women through advocacy and education.

3.5. Global Ecosystem Sustainability

Overcoming the harmful impacts of a changing ecosystem on human health requires political will and motivation which have to be considered in an ethical context. Many of the changes in ecosystems are associated with industrialization or the pressure of the increasing population on the fragile ecosystem.

Global warming has serious consequences on health. Examples of inherent threats include heat waves, the spread of vector born diseases and aboviruses, and the fostering of agricultural pests and fungi. A sea level rise disrupting many coastal ecosystems jeopardizes coastal fisheries, may salinate river water, alter rain fall, advance desertification and displace scores of people living in coastal areas.

Attenuation of the stratospheric zone permits greater amounts of ultraviolet rays to enter the biosphere with adverse effects on human health and biological systems.

Environmental pollution, whether chemical, radiological or biological, will increase in developing countries where industrialization may precede the adoption of preventive measures to control industrial environmental hazards and pollution. The effects on human health are potentially devastating.

To overcome these changes, international cooperation is needed. The cost is tremendous. Since the burden of the guilt for the harm inflicted by the global ecosystem lies mainly on the industrialized nations, it appears ethically equitable that the cost of intervention should be covered by them.

The ethical concern in dealing with the damaging effects of a changing global ecosystem should consider the well-being of the global whole rather than that of the individual, community or even the nation. That means another ethical equity challenge.

3.6. Technological advances

Great progress has been achieved in the biomedical field during the last few decades. More is expected in the following decades. Advances in diagnostic imaging and biological testing techniques as well as in medical forecasting based on genetic testing are continuing. The human genome is now deciphered. Advances in surgical and medical cures, organ and tissue transplantation, xeno transplantation (i.e., organ transplantation from animals), artificial organs, cloning, tissue culture techniques, molecular biology and information technology are reported almost daily. Many ethical issues have been raised and new ethical codes adopted.

The pace of ethical studies needs to be hastened to cope with these rapid advances that may carry serious ethical consequences. As an example, with the advance in fetal surgery; if the mother refuses intervention, because of potential risk to her life, to save her offspring from a fatal or moribund disorder; what are the ethical issues here? The situation is even more complicated if the fetus needing intervention is carried in the womb of a surrogate mother and the surrogate mother refuses access through her body while the true mother (who is not carrying the fetus) approves it.

Now that the human genome has been deciphered, how can we protect individual rights regarding genetic privacy? Should this information about an individual be made public to employer firms, insurance companies, the courts and so on? How can we keep privacy and confidentiality of patient health data that is processed through computers and other machines? Is anonymity a sufficient guarantee for confidentiality? Should we block future epidemic research by blocking all of these data? There is a need to revise continuously our concepts on ethics. As Alain Pompidou, chairman of the European Parliament office for scientific and technological choices, wrote: "Ethics is a thinking which is evolving and always incomplete".

There is a need to develop a vigilance system in order to ensure that rapid advances in science and technology will not result in uncontrollable evolution or unacceptable deviation or harm. Ethics requires that all results, procedures and apparatus must be fully

validated before being made available. Risks involved must be carefully evaluated. Vigilance might even continue when these products are on the market since it is not always possible to foresee their harmful effect.

Scientific advances will result in more costly diagnostic or therapeutic procedures being made available. Advances in modern communication technology will introduce these costly therapeutic interventions in developing as well as in developed countries. Ethical and equity issues will grow. The rising cost of health care will increase inequities between those who can afford and those who cannot. Even in high-income countries it is a matter of serious dispute. In low income countries focus should be given to prevention and primary health care, in the hope that this will minimize the need for the more expensive, frequently unaffordable interventions.

3.7. Changing pattern of disease

Developing countries will face the extra burden of disease. Communicable disease will diminish but will still remain. Examples are AIDS and malaria. Non-communicable diseases will increase because of increasing life span as well as changing life-styles and environmental pollution. New diseases might emerge both in developed and developing countries; AIDS is the classical example. Less known ones are various new types of viral diseases like Ebola virus. "Mad cow disease" and its human analogue, Creutzfeldt Jacob disease, are examples of a new mode of transmission, the prion. The disease affected British beef through feeding the cattle diseased sheep byproducts.

Was it ethically wrong to feed meat meal to a herbivorous species that ultimately affected man?

The AIDS epidemic was controlled in western countries, where there is less reservation about human sexuality, through advocacy,. The same strategy would not work in less liberal societies or with unreachable communities in developing countries. A vaccine is needed. Investing in AIDS vaccine development is an international ethical issue where developed countries can support developing countries that lose annually more than five million people to AIDS, quite apart from the millions of children orphaned by the disease. The scientific and ethical communities must prepare themselves to face other ethical issues as more diseases emerge or re-emerge during the next few decades.

4. Future oriented approach

There is a need to develop an ethical culture in all countries. Governments should sensitize their own decision-making procedures in the light of ethics. Ethics, equity and respect for human rights must be incorporated in all aspects of health care. Ethics has to be institutionalized wherever it is needed. Independent ethical organizational entities should be established. These entities should be continuously working to develop new codes or guidelines which follow advances in science and changes in health-related determinants.

In the pursuit of equity we need to develop a set of indicators to measure disparities in the health status of vulnerable or disadvantaged groups. Ethical entities should stimulate concerned institutions to develop tools and indicators to identify and measure vulnerability, human dignity and equity. These tools should be valid, cost-effective and sensitive. These indicators could be used as a surveillance system to monitor progress of intervention measures and to overcome inequities in health care or abuse of human rights related to health. In developing countries where information systems might be weak, sentinel surveillance systems could be established. In developed countries more elaborate complex indicators may be developed which would not only measure the state of health but also reflect inequities in the general well-being of the individual. Ethical entities should seek to develop an integrated mechanism for systemic vigilance of inequities, abuse or neglect of human rights in health and health-related issues.

Ethical entities should foster research in ethical issues related to health. The gap between research and policy should be narrowed. Multi-disciplinary research teams are needed, involving biomedical, behavioral, social, legal and anthropometric scientists. Research is required to identify vulnerability clearly and to develop a taxonomy and epidemiology of violations of human dignity in the field of health. National aggregate indicators usually do not show inequities in health care. More sensitive indicators involving health and other related factors have to be developed. Research will be required to prioritize health interventions that can ensure equity. There is a need to find out innovative ways to overcome inequalities in health care. In order to ensure sustainability, a training program for relevant personnel is needed. Motivated, well-trained, young ethical scientists would be the guarantee that the present momentum will be maintained for future generations.

The responsibility for carrying out these future tasks should be shared between representative members of the community, professional associations, and the state, as well as the whole international arena. Ethical groups have a great role to play. They are responsible for promoting advocacy measures both to the public and to decision-makers, as well as for fostering international cooperation. The concept that one ideology is universal to the whole world must change. Ideological perceptions from other cultures have to be recognized in order to contribute towards a common understanding on health ethics equity and respect for human dignity between all. Developed countries will need to support developing countries both morally and financially. International committees on ethics should be encouraged. A successful example is the existing one related to the human genome project. Networking between international organizations, both UN and non-governmental, as well as with governmental, academic and advocacy groups will promote the continuous and sustained development of ethics.

While the twentieth century will go down in history as a century characterized by the quest of knowledge, the twenty-first century, it is hoped, will be characterized in history by the wisdom with which the acquired knowledge is applied with equity.

Related Chapters

[Click Here To View The Related Chapters](#)

Bibliography

Bankowski, Z., Bryant J.H, (1994), *Poverty, vulnerability and the value of human life, a global agenda for bioethics*, CIOMS, WHO, Geneva; Switzerland. [The effect of poverty on vulnerability to disease and its ethical dimension].

Bankowski, Z., (1996), Ethics and human values in health policy, *World Health Forum*, Vol. 17, pp. 146-149. [Standard reference text on health policy ethics].

Bankowski, Z. Bryant .J. H and Gallagher J, (1997), *Ethics, equity and health for all*, Publisher, CIOMS, WHO, Geneva, Switzerland. [Highlights the key role of equity in health ethics].

Bryant J, H, Kauser S. K., Hyder A.A, (1997), Ethics, equity and renewal of WHO's health for all strategy, *World Health Forum*, Vol. 18, pp. 107- 148. [An update of health for all strategy taking ethics into consideration].

Gostin, Lawrence, O., (1996), Public health law, a review, *Current Issues in Public Health* Vol. 2, no 6, Oct. - Dec. 1996. pp. 205-314. [An analysis of law and regulations concerning public health and their ethical implications].

Mann, J.M., Gostin L, Gruskin S, Brennan T, Lazzarini.Z, Finberg H.V., (1994), Health and Human Rights, Vol, No1, pp. 6-24. [Right to health as an ethical issue].

Pompidou, A., (1997), Geoethics and equity, *World Health Forum*, Vol 18 pp. 146-149. [Equity in relation to geopolitics].

Sen G, Germain A, Chen L, (1994), *Population policies reconsidered, health, empowerment and rights*, published by Harvard University Press, Boston, U.S.A. [How do population dynamics affect health and human rights? -- an ethical concern].

Biographical Sketch

Prof. Mamdouh Gabr, born in Cairo, Egypt (1925). Graduated from Faculty of medicine, Cairo University, December 1947, MD Pediatrics, Cairo, November 1951, FRCP London 1981.

At the national level, Prof. Mamdouh Gabr was the Minister of Health of Egypt from 1978 until 1982, the Chairman of the population Council from 1978 until 1981, and the Chairman of the Pediatric Department of Cairo University from 1982 until 1986. .He is a member of the High Ministerial Council of Childhood and Motherhood.

At the international level, Prof. M. Gabr was the president of the International Union of Nutrition Sciences from 1985 until 1989, the president of the International Pediatric Association from 1992 to 1995, and he was the President of the Global Advisory Committee on Health Research, WHO, Geneva from 1991 until 1994.

He was awarded the National Prize of Science in Egypt 1961. He is the Bearer of the Order of Science, first degree, 1962, Egypt, and the high Order of the Sacred Treasure, Japan, 1986. He was awarded the WHO Shousha prize in 1997.

He has published four monographs and more than 150 publications on nutrition, child health and development.