

# Medical informatics ethics and its subject

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## Abstract

Application of information and communication technology (ICT) in medicine and health care is a source of ethical questions of practical importance. We argue that medical informatics ethics (MIE) is not a new branch of applied ethics. It is rather a name under which some problems of medical (ME) and computer ethics (CE) are gathered. Some questions of application of ICT in medicine belong to CE and others to ME. In MIE medical ethics meets computer ethics. The borderline between them is neither clear no easy to draw.

**Key words:** computer ethics, medical ethics, medical informatics ethics, code of ethics.

## Beginnings of medical informatics ethics

Computer ethics (CE) has its beginnings in works of Norbert Wiener, the father of cybernetics. Around 1948 he started considering the impacts of information and communication technology (ICT) upon human values like peace, knowledge, health, education, justice. Published in 1950, his book "The Human Use of Human Beings" [1] established his position as the creator of CE. Since the middle of the sixties when Don Parker started an investigation of unethical and illegitimate use of computers, CE is still under development. Creation of the natural-language processing system ELIZA by Weizenbaum was the next important event for CE. ELIZA imitated a psychologist. Weizenbaum was appalled when psychiatrists suggested that the program might be an acceptable substitute for human therapy.

Horrified, Weizenbaum began work on the philosophical problem presented by the mechanization of human characteristics and talents. His book [2] "Computer Power and Human Reason" published in 1976, is Weizenbaum's exploration of his own misgivings about technology and Artificial Intelligence (AI).

Health care is a very important area of application of ICT since the technology has been developed. ICT has many advantages and can deliver great hopes for better health care. Advances in ICT provide users with new capabilities without ethical policies having been formulated to guide those users in their conduct. The concern about ethical implications of the use of ICT in medicine/health care is ongoing. Today it is the subject of conference papers (e.g. ETHICOMP), publications (e.g. Kenneth Goodman [ed.], Ethics, Computing, and Medicine: "Informatics and the Transformation of Health Care" [3]), teaching (the course "Ethical, Legal and Social Issues in Medical Informatics" MINF 515 – 2 credits – is offered by Department of Medical Informatics & Clinical Epidemiology, Oregon Health Sciences University<sup>1</sup>; Medical College of Wisconsin<sup>2</sup> offers the course in "Ethics in Medical Informatics" MI-13201<sup>3</sup>). There are established organizations with the aim of setting and observing ethical standards of using ICT in medicine, e.g. The Health On the Net Foundation (HON)<sup>4</sup>. This non-governmental

<sup>1</sup> See <http://www.ohsu.edu/dmice/courses/offering.shtml> The course comprises the following topics: The protection of confidentiality and privacy in an electronic environment; Implications of the use of telemedicine and decision-support tools in diagnosis and treatment; The implications of electronic communication for the physician-patient relationship; Principles for design and functionality of consumer-oriented Web sites.

<sup>2</sup> See <http://www.mcw.edu/display/Home.asp>

<sup>3</sup> See [http://www.journeyofhearts.org/jofh/jofh\\_old/minf\\_528/intro.htm](http://www.journeyofhearts.org/jofh/jofh_old/minf_528/intro.htm) The following topics are included in the course: privacy, security, confidentiality, encryption, coding, reimbursement, conflicts of interests, reporting, protecting information.

<sup>4</sup> HON's mission is to guide lay persons or non-medical users and medical practitioners to useful and reliable online medical and health information. HON provides leadership in setting ethical standards for Web site developers. More on the site: <http://www.hon.ch/> The Code of Conduct for Medication and Health Web Sites is translated in Polish by Piotr Kasztelowicz (<http://www.hon.ch/HONcode/Polish>) and presented at the II Conference of Medical Internet in 1997.

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organization was created in 1995 under the aegis of the Direction générale de la santé Département de l'Action Sociale et de Santé: République et canton de Genève, Switzerland). Porfirio Barroso Asenjo at the conference ETHICOMP 95 presented which had been already accepted in Greece "Health Informaticians' Deontology Code" (HIDEC). In 2000 the eHealth Ethics Initiative introduced an international code of ethics for health care sites and services on the Internet<sup>5</sup>. There are working groups dedicated to investigations of ethical, and legal issues of medical informatics, e.g. the Working Group "Ethical, Legal, and Social Issues" (ELSI-WG) of American Medical Informatics Association<sup>6</sup>. In 2002 at Taipei the International Medical Informatics Association (IMIA)<sup>7</sup> endorsed "The Ethical Code of Practice"<sup>8</sup>. A working group "Ethical, Legal, and Social Issues" of IMIA is represented by Peter Winkelstein (AMIA)<sup>9</sup>.

In this paper the methodological status and major questions of medical informatics (computer) ethics (MIE) will be discussed.

There are at least two sets of issues. One set concerns existing problems of medical ethics (ME) which are exacerbated by the employment of ICT in medicine, e.g. the problem of privacy and anonymity. The second set concerns potentially new problems, problems which as yet have not arisen, at least not in any significant way, e.g. the existence of cyborg.

MIE comprises problems of CE that are related to health and health care and questions of ME that arise from applications of ICT. It means that MIE is not a separate scientific discipline. It is rather a conglomerate of CE and ME. For example, the question of sale of drugs via the Web belongs to CE, but the questions concerning treatment supported by an expert program belong to ME. We will try to establish a demarcation line between problems of MIE that are considered by CE and problems of MIE that are subject of ME. As we will see the borderline is neither clear nor easy to observe. The frontiers are fuzzy. Our coverage of the main themes is by no means intended to be exhaustive, and several of the issues raised here need further consideration.

## Subject of medical informatics ethics

We will try to determine the scope of MIE. We will argue that it comprises several subjects of study.

In order to achieve our aim first of all we have to distinguish

<sup>5</sup> <http://www.ihealthcoalition.org/ethics/ehcode.html>

<sup>6</sup> The mission of the Group is:

To draw attention to and raise awareness of ethical, legal, and social issues (ELSI-WG) in health informatics.

To serve as a resource to help AMIA members and others address ethical, legal and social issues in professional and academic endeavors.

To identify additional resources and develop educational programs and curricular materials for AMIA members and others.

To conduct and support scholarly research aimed at identifying ethical, legal, and social issues in health informatics and at expanding discussions and analyses of these issues.

See <http://www.amia.org/working/elsi/main.html>

<sup>7</sup> <http://www.imia.org>

<sup>8</sup> IMIA Code of Ethics for Health Information Professionals: [http://www.imia.org/English\\_code\\_of\\_ethics.html](http://www.imia.org/English_code_of_ethics.html)

<sup>9</sup> See [http://www.imia.org/2002\\_scientific\\_map.html](http://www.imia.org/2002_scientific_map.html)

between ethical problems of impact of ICT on health and ethical problems of application of ICT in health care and medicine.

Technology enhances productivity, expands functionality and improves quality of life. This statement is especially true about ICT. But it is only one side of technology. Technology has also another side. It is potentially harmful to the natural environment and in particular to health, physiologically and psychologically<sup>10</sup>. Long hours spent at the computer can cause problems with sight, spine, wrist. Health may be threatened by radiation emanating from computer monitors. It is possible, for example, that users will feel stressed trying to keep up with high-speed computerized devices. Addiction to computers and Internet is already a social issue. For example, in 2004 a centre to help addicted young people was established in Elk, a Polish town of 60000 inhabitants. Problems of ICT effects on individual and on public health are subjects of work safety. Their ethical aspects are being considered by CE.

Medicine in the broadest sense comprises organization and administration of health services, prophylaxis, treatment and rehabilitation, manufacturing and distribution of medical equipment and drugs, study and education. Ethical problems both in medicine and in application of ICT are common to all these domains. It seems that as in ME as well as in MIE the problems should be divided according to human values. If so the MIE has to be focused on human and his/her health or – quite generally speaking – on human life.

The Hippocratic Oath expresses the principal precepts of ME. It is not only the oldest professional code but a pattern of professional codes at all. In 1976 one of the creators of CE, Walter Maner, "while teaching a medical ethics course, noticed that, often, when computers are involved in medical ethics cases, new ethically important considerations arise. Further examination of this phenomenon convinced Maner that there is a need for a separate branch of applied ethics, which he dubbed 'computer ethics' (Wiener had not used this term, nor was it in common use before Maner). By the early 1980s, the name 'computer ethics' had caught on, and other scholars began to develop this 'new' field of applied ethics [4]. Maner noticed that some old ethical problems are made worse by computers, while others are wholly new because of information technology. He<sup>11</sup> defined CE as a branch of applied ethics which studies ethical problems "aggravated, transformed or created by computer technology". For Deborah Johnson, CE studies the way in which computers "pose new versions of standard moral problems and moral dilemmas, exacerbating the old problems, and forcing us to apply ordinary moral norms in uncharted realms"<sup>12</sup>. James Moor taking into account that ICT provides us new capabili-

<sup>10</sup> The same is true about medicine. The famous Hippocratic aphorism *primum non nocere* (first do no harm) reminds a physician that he or she must consider the possible harm that any intervention might do. It is most often mentioned when debating use of an intervention with an obvious chance of harm but a less certain chance of benefit.

<sup>11</sup> Maner contributed not only to the theory of CE. Traveling around America gave speeches and conducted workshops at conferences. He self-published A Starter Kit for Teaching Computer Ethics [5]. Computer Ethics [6], the first textbook – and for more than a decade, the defining textbook – in the field was published by Deborah Johnson of Rensselaer Polytechnic Institute.

<sup>12</sup> See [6], p. 1.

ties and these in turn give us new choices for action, maintains that a “typical problem in computer ethics arises because there is a policy vacuum about how computer technology should be used”<sup>13</sup>. For Terrell Ward Bynum it is the best available definition of the field<sup>14</sup>. Krystyna Górniak-Kocikowska predicts that due to globalization of ICT, computer ethics will disappear. “Local” ethical theories will eventually be superceded by a global ethics evolving from today’s CE. “Computer” ethics, then, will become the “ordinary” ethics of the information age<sup>15</sup>. Deborah Johnson maintains that in information age CE will become ordinary ethics and ordinary ethics will become CE<sup>16</sup>. On Johnson’s view, in information age ICT will permeate all aspects of our everyday life. Its presence will no longer be noticed. Thus there will be no special CE problems. In all the ethical issues the questions of CE will be involved.

For the discussed concepts of CE, MIE is a part of CE that concerns ethical questions raised by application of ICT in medicine. ME is not proper to examine ethical problems of medicine implied by ICT technology. Moreover, in the future ME will be only a branch of applied CE (albeit – according to Górniak-Kocikowska and Johnson – the name CE may not be in usage).

Different approach to defining the field of CE is advocated by Donald Gotterbarn. For him CE is a branch of professional ethics. It concerns “the values that guide the day-to-day activities of computing professionals in their role as professionals. By computing professional I mean anyone involved in the design and development of computer artefacts. The ethical decisions made during the development of these artefacts have a direct relationship to many of the issues discussed under the broader concept of computer ethics” [10]. For this concept of CE we may

maintain that as ICT engineers and medical doctors are different professions as CE and ME are different ethics. As long as there is no such a profession as ICT medical doctor or medical ICT engineer, there is no MIE branch of professional ethics.

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<sup>13</sup> See [7], p. 266

<sup>14</sup> Cf <http://plato.stanford.edu/entries/ethics-computer/>

<sup>15</sup> Cf. [8].

<sup>16</sup> Cf. [9].