Know Thyself

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Summary
This article is part of a For-Discussion-Section of Methods of Information in Medicine on "Biomedical Informatics: We Are What We Publish" written by Peter L. Elkin, Steven H. Brown, and Graham Wright. It is introduced by this editorial and followed by a commentary paper with invited comments. In their paper, P. Elkin et al. attempt to define the fields of Medical Informatics and Bioinformatics through a bottom-up approach by searching the medical literature. This innovative approach provides interesting results that are discussed in the commentary paper. In subsequent issues the discussion may continue through letters to the editor.

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The paper of Peter Elkin, Steven Brown and Graham Wright [1], published in the present issue of Methods of Information in Medicine tries to answer an essential question for our scientific community: Who are those people who describe themselves as Biomedical Informaticians and/or Bioinformaticians? What is the scope of their activities and researches?

Since the creation of AMIA and IMIA [2], the question of the delineation of Medical Informatics and, more recently Bioinformatics, has been challenging. In their book [3], edited in 1990, Blum and Duncan already listed a series of topics such as: computer systems, signal and image processing, clinical data processing, or patient management systems. Since the seventies, several handbooks in Medical Informatics have been edited [4, 5], covering large fields where computer science has been applied to medicine and healthcare. As stated by Winter et al. [6], modern technology for information processing is not only something nice to have for physicians but one of their most used tools. Informatics is everywhere but what is its research, what are the publications in the so-called Medical Informatics? Most frequently, the essence of all Medical Informatics research is the formalization of problems in health care [7]. But new domains are opened by innovative aspects of computer science as data mining, usage, evaluation, or visualization.

That is why the paper of Peter Elkin et al. is welcome, trying to define our field both for our own internal uses and to the biomedical community at large.

The first objective of the study was to build an ontology (the Health Information Ontology) based on two sets of concepts and terms: those of the AMIA consensus document and those of the IMIA definitions. When merged, this Health Informatics Ontology (HIO) contains 433 concepts and 462 terms. Hopefully, there was enough consistency that the authors were able to merge the two classifications. This ontology was implemented using a terminology server utilizing the intelligent natural language processor (iNLP).

The second objective was to identify, through a query in Pubmed, whether the papers identified by the key-words "Medical informatics" OR "Bioinformatics" contained at minimum one term present in the Health Information Ontology. Through the iNLP HIO, the authors found at least one concept to be associated in 37% of the 168,298 articles. By parsing 27,000 articles with clinical sub-specialties of SNOMED-CT, it was possible to identify the body site
This work challenges us all. We are all involved in hospital, academic, and/or research activities. A clear definition of the fields described as Biomedical Informatics and Bioinformatics will enhance our visibility and presence. In most of the universities, Biomedical Informatics is now part of the curriculum of the medical students. In many European countries (like France), a new regulation makes it mandatory in the second part of their training. There are still harsh discussions on the number of teaching hours; organization of the training sessions; modalities of evaluation; etc. but the road is set. In Universities and Research Organisations, Biomedical Informatics and E-Health are recognised as a research domain. For 25 years, the European Commission has supported the Programme Information and Communication Technologies for Health (ICT for Health) by granting collaborative projects gathering research labs, industrial companies, and users. We hope that this will continue. The identification of research topics as proposed in this article, will help decide on supportive actions in this field.

The paper of P. Elkin et al. gives the opportunity to open large discussions on the definition, role, and place of our discipline in various contexts. This dispute has started in another paper of this issue of the journal: “Discussion of ‘Biomedical Informatics: We Are What We Publish’” where internationally recognized experts of the field comment the study [8]. Most of these experts acknowledge the importance of the topics addressed in the paper, and the necessity to continue the work initiated by P. Elkin et al. Some of them criticize methodological aspects and limitations that could explain why only 37% of the identified papers contain at minimum one concept of the ontology built by the authors. Readers are encouraged to carefully examine all these comments. This discussion highlights the inherent difficulty of such a work. It also reminds us that it is important to choose relevant key-words for indexing our papers for a better visibility of the discipline in Pubmed or through Internet browsers.

As for many innovative ideas, this work gives rise to new interrogations. One titilating question is the question of the boundaries. For many people, the border between Biomedical Engineering and Biomedical Informatics is not obvious: biosensors register biosignals that are sent through networks to databases for analysis and interpretation. The signals are collected in databases, where they can be aggregated with data from the medical records, images, for providing healthcare professionals with the relevant information for interpretation, diagnosis and therapeutic procedures. Where are the borders of Biomedical Informatics?

The clinical domains in which the words “Medical Informatics”, and “Bioinformatics” are the most frequently observed are, not surprisingly: disorders of the cardiovascular system, neoplasm, disorders of the nervous system (Table 3). This demonstrates that there are a growing number of medical disciplines impacted by our domain of competence.

The paper is entitled “We Are What We Publish”. Looking at the publications identified in Pubmed, using the key-words Medical Informatics and Bioinformatics, our community has the opportunity to reinforce its visibility in the research field, by using relevant key-words, good paper indexation, and crossed citations.

Socrates said: “know thyself”. Knowing yourself takes years of searching and insight. Peter Elkin paves the road.

References