Editorial

Advances in an Interdisciplinary Science

The 1992 IMIA Yearbook of Medical Informatics reflects the worldwide research and development in medicine and health care where computers play an essential role. Most of today's hospitals and practices are equipped with computers for the support of patient care, administration, and data communication. The development of such systems is based on extensive experience, obtained only after several generations of people and systems. A substantial part of the development of these systems can still be considered an *art*; the *science* required for such development is continuously expanding in size and importance.

To reflect the state of the art, it was decided by the Board of IMIA (International Medical Informatics Association) to publish a yearbook that would contain high-quality papers that appeared during the preceding year in the scientific literature. It is the strong belief of the Board that the progress of medical informatics is foremost served by the same principles that apply to all other scientific disciplines in our modern age: by carrying out advanced research, brought forward to the scientific community in refereed journals.

The editors of this Yearbook have gladly adopted this view and have collected a series of papers from the scientific literature, representing the richness and interdisciplinary nature of this field. The editors selected articles that reflect methodology in medical informatics, since it is primarily methodology that can be transferred from one center to the other and from one generation to the other.

Composition of the Yearbook

The scientific part of the Yearbook is preceded by factual information on IMIA and its national member societies as well as its regional groups. In addition, information is given on the activities of several Working Groups within IMIA. The section on selected articles is preceded by an introduction and concluded by an authors' and a subject index. Listed then are the titles of all articles that appeared during 1991 in five leading medical informatics journals, alphabetically ordered by their first authors, and also followed by a subject index. The Yearbook ends with a list of medical informatics subject headings that are used for indexing by the National Library of Medicine, followed by a list of companies that are regularly mentioned in medical informatics journals.

Selection of Articles

A large number of journals was scanned to select candidate articles; chapters from books and conference proceedings were not included. Suggestions for

articles for the Yearbook from advisory editors were also welcomed and carefully evaluated. The selection of papers was intentionally not restricted to only those published in medical informatics journals. On the contrary, with the help of the National Library of Medicine, a large number of other journals was scanned for scientific contributions at the crossroads of medical informatics and medicine and health care. It was, understandably, not possible to honor all suggestions made for high-quality papers. It should be realized, therefore, that outside the selections in the present Yearbook, there is a host of other fine and representative articles to be found in textbooks, conference proceedings and many journals. The editors wanted to disseminate the selected material to the world medical informatics community and for that reason selected contributions in the English language only, realizing, however, that much material is also published in many other languages.

The articles published in this 1992 Yearbook reflect the growing impetus from clinical and health care disciplines. It was a surprise to the editors that among the more than 200 authors from 13 countries who contributed to the 54 articles in this Yearbook, 50% had a medical background. All others came from a variety of other disciplines. The distribution of different departments that contributed to the selection of articles was equally surprising (see Table 1): in the studies which underlie the articles in the Yearbook, there was an equal number of departments involved from the medical as well as from the non-medical side (51 and 53, respectively). The largest impact of medical informatics is apparently on clinical departments such as Internal Medicine, Cardiology and related disciplines (comprising 39% of the medical and health care group in Table 1), whereas of all departments Radiology alone accounted for about 18%; health care-related departments contributed 22%. Of the non-medical group, departments of Medical Informatics or those closely related counted for approximately 43%; departments or faculties of Engineering contributed only slightly less, 36%. Similar figures can be derived from the types of journals that contributed to the Yearbook: of all 54 articles, 20 (37%) were drawn from five leading medical informatics journals, 7 (13%) from technical or engineering journals, 4 (7%) from basic medical sciences journals, 3 (6%) from health care-related journals, and 20 (37%) from journals related to a variety of medical disciplines. It is reassuring that, apparently, there is a steadily increasing number of medical informatics-related papers in medical journals.

All articles have been categorized by the editors into seven main groups: Health and Clinical Management (8 articles), Clinical Support Systems (8), Image and Signal Processing (10), Decision-Support Systems (8), Knowledge-based Systems (10), Neural Networks (5), and Biomedical Research (5). It appears that the main research area in our field is related to the structuring of medical knowledge, the subject of three different sections in this Yearbook and comprising almost 50% of all selected papers. Articles in this area originate from major research groups in medical informatics; one-third of these 23 papers was published in medical journals. It was unexpected that a fair number of articles dealt with the application of neural networks, so that a separate section in the Yearbook could be devoted to this subject. The contents of each section are briefly reviewed in the Introduction to the Yearbook.

Table 1: Number of medical and health care departments, and non-medical departments involved in the 54 selected scientific articles in the 1992 Yearbook

Departments of Medicine and Health Care	Number of Departments	Non-Medical Departments	Number of Departments
Internal Medicine and Cardiology	20	Departments of Medical Informatics	23
Other Clinical Departments	8	Departments of Engineering	19
Radiology, Laboratories	12	Basic Medical Sciences	4
Departments of Health Care	11	Other	7
Total	51	Total	53

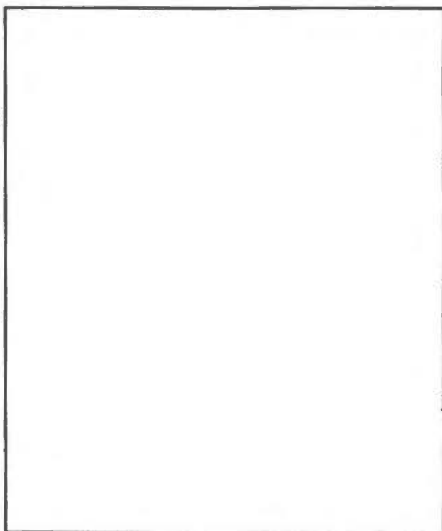|	
Internal Medicine and Cardiology:	Internal Medicine, Cardiology, Oncology, Infectious Diseases, Rheumatology
Other Clinical Departments:	Pediatrics, Obstetrics, Surgery, Anesthesiology, Emergency Medicine, Physical Medicine
Radiology, Laboratories:	Radiology, Clinical Chemistry, Pathology
Departments of Health Care:	(Clinical) Epidemiology, Public Health, Nursing, Family Medicine, Sports Medicine, Health Policy and Management
Departments of Medical Informatics:	Medical Informatics, Clinical Information Sciences, Medical Computer Science
Departments of Engineering:	Electrical Engineering, Signal and Image Processing, Robotics, Speech Processing
Basic Medical Sciences:	Biochemistry and Biophysics, Genetics, Medical Physics
Other:	Biostatistics, Clinical Decision Making, National Library of Medicine

The editors of the Yearbook sincerely hope that readers of the articles presented here will be stimulated to pay even more attention to the scientific literature when establishing research projects of their own and when offering future publications to medical or medical informatics journals.

The 1993 IMIA Yearbook of Medical Informatics

The format of the 1993 Yearbook will be a further elaborated version of the present Yearbook. It is the intention of the editors to include more background material that is of interest to the worldwide community of people who either professionally or indirectly work with computers in medicine and health care. It is also foreseen that a more complete and extensive list of companies and their products that offer systems to medicine and health care will be included in forthcoming Yearbooks.

To that end medical investigators, professional workers in medical informatics, chairmen of working groups, IMIA representatives, health care managers, and companies are invited to send their ideas and material as early as possible to the editors of the IMIA Yearbook.

We sincerely hope that the annual publication of this Yearbook will further structure our field of medical informatics, increasing the awareness of researchers, encouraging them to publish reports of high scientific content, and stimulating developers of systems to inform their colleagues and potential end-users about the value of their products.

Acknowledgements

Jan H. van Bemmel,
Erasmus University Rotterdam, The Netherlands
Alexa T. McCray,
National Library of Medicine, Bethesda, Maryland, USA