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Conference Report

Microcomputers and the Future of Epidemiology

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Synopsis

The Workshop on Microcomputers and the Future of Epidemiology was held March 8-9, 1993, at the Turner Conference Center, Atlanta, GA, with 130 public health professionals participating. The purpose of the workshop was to define microcomputer needs in epidemiology and to propose future initiatives. Thirteen groups representing public health disciplines defined their needs for better and more useful data, development of computer technology appropriate to epidemiology, user support and human infrastructure development, and global communication and planning.

Initiatives proposed were demonstration of health surveillance systems, new software and hardware, computer-based training, projects to establish or improve data bases and community access to data bases, improved international communication, conferences on microcomputer use in particular disciplines, a suggestion to encourage competition in the production of public-domain software, and long-range global planning for epidemiologic computing and data management. Other interested groups are urged to study, modify, and implement those ideas.

The application of microcomputers to epidemiologic and other public health tasks is advancing rapidly, since it lies at the intersection of at least two other dynamic fields, computer technology and epidemiologic statistics. To record recent advances and obtain ideas for future development in the field, 130 experts in various fields of public health participated in the Workshop on Microcomputers and the Future of Epidemiology, held March 8-9, 1993, at the Turner Conference Center, Atlanta, GA, sponsored by the Centers for Disease Control and Prevention (CDC) and the Division of Epidemiology of Emory University School of Public Health.

The workshop was organized to provide a 5-year needs assessment and ideas for initiatives that would be a basis for planning by the developers of the programs Epi Info and Epi Map, and by other groups and persons interested in the use of microcomputers in epidemiology.

Methods

Invitations were sent to experts in the fields of public health surveillance, statistics, epidemiologic investigation, international health, clinical trials, medical records, laboratory medicine, epidemiologic education, health promotion, communication, and software design and engineering. Producers of epidemiologic public-domain microcomputer software also were invited. The list of invitees was compiled from personal contacts, previous correspondence, and the lists of epidemiologic organizations and public-domain software contained in the reference Episource (1).

Funds were available to support travel for only a few of those who wished to attend; the others found funding from outside sources or paid their own way. The attendees were a highly motivated, but not necessarily a representative sample, of epidemiologists and microcomputer specialists. The registration form

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included an optional questionnaire describing work patterns and soliciting ideas for future software development. Eighty-two of the 130 participants completed the questionnaire.

During the first day, participants assessed micro-computer needs in each of 13 small groups representing fields in public health. The small groups focused on chronic disease and health promotion; city, county, and State health departments; environmental health and injury; epidemiologic and statistical education; hospital and medical records and death investigation; infectious diseases and epidemiologic investigation; international health; management, supervision, leadership, and administration; occupational health; public health computing; surveys and statistics; veterinary epidemiology; and vital statistics and surveillance.

During the second day, after presentations on the future of computer science, participants in the same groups developed initiatives or projects in areas that they considered important. On both days, the conclusions of the small groups were presented to the larger workshop by the group leaders or reporters. Written summaries were prepared from the presenters' overhead transparencies and from notes and videotapes of the presentations.

Results

Those who completed the questionnaire listed their professional work hours by categories. They listed administration for 26 percent of work hours, computer support (18 percent), statistical analysis (16 percent), epidemiology (14 percent), and teaching (12 percent). Only 0.3 percent of time was spent in clinical work. Of total hours spent with a micro-computer, 39 percent were spent in word processing and 26 percent in analysis of data. Programming (8 percent), statistics (8 percent), data base management (6 percent), communication (5 percent), and graphics (4 percent) were the other major activities.

During the first day, the small groups identified "needs or visions" for the next 5-10 years. The results are outlined in the accompanying box. During the second day the groups were asked to suppose that they were a task force formed to develop "a plan of action that could actually be implemented," to address one or more of the needs or visions of the previous day. The initiatives developed are listed in the box.

Discussion

The broad scope of the needs or visions and the proposed initiatives reflect the diverse backgrounds of the attendees. Software developers may be surprised at the emphasis given to data needs and to user support, while others may be stimulated by the wealth of technological suggestions. The results clearly demarcate several new threads of epidemiologic computing. The emphasis on international communication and cooperation reflects the success of international computing efforts such as Internet (2) and the translation of Epi Info (3) or its manual into 10 languages.

The struggle to link diverse data sources for public health use will require major advances in technology, public and private attitudes, and human resources and skills. It is clear that planning efforts to improve the state of epidemiologic computing must consider (a) data content, availability, and quality; (b) computer technology adapted to public health use; (c) human resources and skills for computing; and (d) international cooperation and data exchange in many languages.

The results provide ideas for future work in the epidemiologic use of microcomputers. Agencies and others should use the expressed ideas as a springboard for further discussion, planning, and implementation. A detailed, 60-page summary of the results is available from the author.

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**Initiatives in Epidemiologic Computing Proposed
by Small Groups of Experts from 13 Public Health
Disciplines**

Data

A better statewide health event information system

A broad, standardized data base for use and input by all possible health providers and groups

Electronic access to diverse data sets in a variety of agencies

A comprehensive, community-wide health information system

Methods for improving the quality of infectious disease surveillance

A streamlined and enhanced WONDER data base

Technology

Computer-based training for epidemiologic and statistical education

A natural language query data base demonstration project

Environmental risk appraisal software

The "public health wizard," a pocket computer for field use in public health

Epi Info as an extensible vehicle for user-written statistical software

A national hospital discharge data system

People and communication

An international user's group for public-domain epidemiologic software

An international, electronic data base of examples, recommendations, and teaching materials for microcomputer support of individual leaders and managers in public health

Improved communication in the occupational health and safety community

A forum for veterinarians and programmers or designers of software to determine microcomputer needs for veterinary epidemiology and public health (in conjunction with the USDA/ACPVM Symposium on Veterinary Epidemiology)

Competition in public domain software development

Planning

An international partnership of organizations involved in health to improve software and data elements for surveillance

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References

1. EPISOURCE: A guide to resources in epidemiology, edited by R.H. Bernier and V.M. Mason. The Epidemiology Monitor, Roswell, GA, 1991.
2. Marine, A., Kirkpatrick, S., Neou, V., and Ward, C.: Internet: getting started. Prentice Hall, Englewood Cliffs, NJ, 1993.
3. Dean, A. G., Dean, J. A., Burton, A. H., and Dicker, R. C.: Epi Info: a general-purpose microcomputer program for public health information systems. Am J Prev Med 7: 178-182 (1991).

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Visions and Needs Identified by Small Groups of Experts from 13 Public Health Disciplines

Data

Access to quality data for demography, morbidity, mortality, costs, and environmental and behavioral risk factors

A data and communication network that would extend to the entire health community (physicians, insurers, laboratories, and national, State, and community health departments), to political decision makers, and to the general public

Linkage of medical and other records across time, space, and topic, while protecting confidentiality

Timely data gathering as close to the event as possible

Standardization of data sets and collection methods

Technology

Access to and early processing of large data bases; natural language query of data bases

Expert systems for access to medical records

Voice and character recognition systems

Standardization and open access to existing and new public health software

An expandable core of software for surveys and statistics

More powerful and user-friendly hardware and software, and training in their use

Software for veterinary public health, mapping, and hazard and risk communication

People, training, and communication

More training, education, and communication in use and reporting of public health information

Need for computer based training and instruction on use of computers

Software support and access to upgrades

More universal accessibility and training for use of existing administrative software

International, national, State, and local electronic bulletin boards for communication of latest public health software, data, and techniques

Planning

A global, multi-level research effort for planning public health computing