Preface

The use of Geographic Information Systems (GIS) in the health sector is an idea whose time has come. This is by no means a novel concept; spatial analysis has been around as long as we have thought about spatial associations of disease, whether looking at determinants, distributions, outcomes or utilization. The current applications of GIS in health are diverse and extensive—I have had the privilege of co-chairing two conferences on the topic, and have been impressed with the wide array of geographically enabled projects and processes in the field.

The present GIS environment is heavily driven by technology and such an approach is indeed logical for the most part. However, the needs of less developed countries in utilizing the concepts and technologies of mapping should not be neglected in the continuing evolution of GIS. In the current computing environment, where processors seem to be in need of an upgrade on an annual basis or sooner, it should be realized that there remain barriers to the utilization of GIS, which include the costs associated with training, equipment and personnel as well as with sustainability. It is therefore imperative that the collective health geographics community be an inclusive one and support the use of technologies appropriate to a variety of settings, whether in the developed or the developing world. It is essential that the resources of the technological era be brought to bear on bridging and not expanding the divide between the two.

The technology of health mapping is only as good as the underlying concepts, whether applying to a scientific research question or exploring a new way of planning health delivery. This book is about sharing the results of some of the most innovative and useful ways in which our colleagues are utilizing GIS and spatial analysis to solve health-related issues. I am honored to be associated with the wealth of talent and expertise that lies between these pages. The work you will read

about is a small but, I hope, representative sample of the diverse applications in this growing field.

As with our conferences, Ric and I have selected the best of the best in this volume. We have tried to make sure there is a mix of applications from various sub-sectors within the field(s) of health. We have divided the chapters into the following sections:

- *Section 1: Health Disparities & Community Health Issues*
- *Section 2: GIS & Cancer*
- *Section 3: Infectious Disease & International Health*
- *Section 4: Hospitals & Healthcare*

Health disparities have been studied a great deal, but not very much has been done to solve the problems therein using GIS. Health mapping has a great deal to contribute to this area, since much of the discussion is around issues of health and place. Practitioners and academics in the field of community health are well aware of this, and the chapters in the first section of the book address the issue head-on, led off by a conceptual piece co-authored by Dr. Mohammed Akhter, Executive Director of the American Public Health Association, and Dr. Gregory Pappas, one of the country's leading thinkers in this area and former Senior Advisor to the U.S. Surgeon General. The pieces which follow are in-depth analyses of the ways in which geographic methods can be used for community health, health disparities and particular issues affecting communities such as alcohol-related problems. We hope you find *Health Disparities & Community Health Issues* a thought-provoking and informative collection.

Our second section on *GIS & Cancer* reflects the reality that while the global threat of infectious diseases looks to be eradicable (given adequate resources and political will to do so), the scourge of cancer remains a leading cause of morbidity and mortality in the developed world. From Long Island, New York to Galicia, Spain, the authors included in this section provide invaluable insights as to how cancer determinants and outcomes can be mapped and addressed using geographic technology.

Bangladesh, China and West Virginia all have in common the fact that infectious diseases (albeit different ones!) remain a cause for concern. While the so-called epidemiological transition shows a logical progression from infectious to chronic disease, in many regions of the world there remains a dual threat from both. Whether seeing patients in a community health center in Karachi or at a travel clinic in Baltimore, it is readily apparent that the spread of many 'exotic' diseases is a

plane flight away—and the world is smaller than it once was. Mapping this world is the task of our authors in the section on infectious disease and international health. While the science of epidemiology is rooted in older, established methods, the authors of this section present innovations on this theme which is apparent in chapters on such as animating rabies patterns, remote sensing in China, spatial modeling in Bangladesh, and an exciting new application of GIS and DNA fingerprinting.

A burgeoning use of GIS in the last few years has been in the hospitals and healthcare sector, and our fourth section is devoted to this emerging field. There are active discussions to expand the application of GIS in this area, discussions which Associate Editor Ric Skinner is actively involved in. This section is a rich collection of theoretical work and case studies from around the world. The applicability of GIS to the scale of individual facilities has not been envisioned previously, but now, a new breed of thinkers is expanding the borders of the use of health mapping both within and beyond the hospital walls. From exploring consumer markets, to mapping patients' access to care, to mapping the human body itself—there is a growing array of interesting and immediately applicable research coming out of this field. We expect to see a lot more in the near future.

This book presents a sampling of the many applications utilizing GIS in the field of health. We hope to hear back from those who will use the book in the classroom, in the workplace and in the field. To the readers of the book, please let us know how you have used it, whether as part of university curricula, as part of your day-to-day applied work or as a resource guide. Your feedback is an invaluable part of this continuing body of work, and is the best way for us to respond to the needs of those who are involved in this dynamic field.

Omar A. Khan
Editor

REFERENCES

Albert, D. P., Gesler, W. M., & Levergood, B. (2000). *Spatial Analysis, GIS, and Remote Sensing Applications in the Health Sciences.* Detroit, MI: Ann Arbor Press.

Campbell, B., Adjei, S., & Heywood, A. (1996). *From Data to Decision Making in Health: The Evolution of a Health Management Information System.* Royal Tropical Institute, Amsterdam, The Netherlands.

Fauveau, V. (Ed.) (1994). *Matlab: Women, Children and Health*. ICDDRB, Dhaka, Bangladesh.

The Institute for the Future. (2000). *Health and Health Care 2010.* San Francisco: Jossey-Bass.

Khan. O. A. (1999). The First International Health Geographics Conference. *American Journal of Public Health*, (April).

Kolb, D. C. (1999). *Team Leadership.* Durango, CO: International Learning Works.

Lang, L. (2000). *GIS for Health Organizations*. Redlands, CA: ESRI.

Mitchell, A. (1997). *Zeroing In: geographic information systems at work in the community*. Redlands, CA: ESRI.

Murray, C. J.L. & Lopez, A. D. (1996). *Global Health Statistics.* Geneva, Switzerland: World Health Organization.

National Research Council. (1996). *Bridge Builders: African experiences with information and communication technology.* Washington, DC: National Academy Press.

Senge, P. M. (1990). *The Fifth Discipline: the art and practice of the learning organization*. New York: Currency Doubleday.