

in terms of early developments of mature forms. My question is whether it makes sense to pursue this frame of reference further or to alter that frame as the work is carried further.

Geocoding Health Data: The Use of Geographic Codes in Cancer Prevention and Control, Research, and Practice

Edited by Gerard Rushton, Marc P. Armstrong, Josephine Gittler, Barry R. Greene, Claire E. Pavlik, Michele M. West, Dale L. Zimmerman
Boca Raton, FL: CRC Press, 2008. vii, 248 pp, maps, figures, author index, subject index
\$99.95. Hardcover
ISBN 978-0-84938-419-6

*Reviewed by Russell S. Kirby
University of South Florida*

Geographic information systems (GIS) have come into increasing use in health and social services research and practice. The process of geocoding to transform addresses into mappable information is an essential function, whether associated with health events or documentation of services. In this monograph, Gerard Rushton and his colleagues, most of whom have affiliations with the University of Iowa or state and federal agencies, provide a comprehensive overview of this process. In a series of thirteen chapters, theoretical and methodological considerations are discussed in detail, including analytical applications, methods for preserving privacy, and statistical approaches for analyzing geocoded health data. Each chapter begins with a structured outline, includes figures and tables to illustrate key concepts, and concludes with a series of references to materials cited in the text.

The book begins with a brief introduction in which the rationale for spatial analysis of health data and the purpose and structure of the monograph are explicated. Armstrong and Tiwari then provide a comprehensive and straightforward overview of the methods and materials used to geocode health records. In addition to defining key concepts, some commonly used geographic databases available for batch and interactive processing are described. The chapter concludes with a detailed discussion of the various types of geocoding errors that might occur and potential solutions to each type of problem. This chapter and Chapter 5 on "The Science and Art of Geocoding" are by themselves worth the price of the book to instructors teaching introductory geographical information systems (GIS) courses. The book also includes a chapter reviewing current geocoding practices in cancer registries. The

North American Association of Central Cancer Registries (NAACCR) has been exemplary in its development of data collection and management standards specifically for cancer registries but with broad applicability to all types of health data, and some of these efforts are highlighted together with references to key resources.

The uses and challenges in using data aggregated by zip codes are reviewed by Beyer, Schultz, and Rushton. This chapter focuses not only on challenges in obtaining appropriate demographic denominator data (especially zip codes in relation to Zip Code Tabulation Areas (ZCTAs)), but on choropleth vs. isopleth mapping and the use of post office locations compared to geometric and geographic centroids for analyses involving generation of spatial surfaces through interpolation.

Protecting privacy and confidentiality is a major concern for managers of potentially geocode-able health databases. "Reverse engineering" could potentially identify an individual or family and reveal personal health or demographic information from geocoded location data. Accordingly, the editors chose to include two chapters pertaining to this important subject. Methods for applying geographical masks are described and evaluated by Zimmerman, Armstrong, and Rushton in the first of these chapters, and this is followed by a chapter in which Chen, Rushton, and Smith describe the methodology involved in applying one of these methods.

The book also contains several chapters exploring disease mapping methods and spatial analysis techniques. These include chapters by Rushton and colleagues demonstrating the use of spatial filters to explore scale effects and patterns generated by individual records compared to spatially aggregated data, by Waller reviewing methods for spatial analysis of point location and areal count data, and by Zimmerman on methods for analysis of incompletely and incorrectly geocoded health data. Another chapter by Armstrong, Greene, and Rushton briefly reviews methods for estimating distances and measuring geographic accessibility.

The monograph concludes with an appendix listing citations to statutes and regulations governing the cancer registries in each U.S. state, followed by author and subject indexes. The text is well illustrated with figures, diagrams, maps, and screenshots from relevant software applications, and aerial photographs to illustrate common problems in geocoding, with tables included where appropriate.

The editors and authors are to be commended for covering almost all of the basic issues in geocoding health data and using the results for spatial epidemiology, public health, and health services research. However, this text consists of only 248 pages with a

few pages of introductory material, and some topics are given briefer treatment than might have been desired. For example, the chapter on generating spatial continuous disease maps is followed by a three-page appendix describing the DMAP IV software. This is useful, but alternative methods are not described, nor does the appendix include a URL for readers wishing to explore this approach with their own data. A section providing guidance on how to report the results of geocoding in reports and scientific publications based on geocoded health data would enhance the text. On balance, however, this monograph does an excellent job of describing and elaborating the significant issues and methods involved in geocoding health records and analyzing and presenting results based on these data.

Some may wonder what relevance this book holds for their own work, given its explicit focus on geocoding of cancer data. The answer lies in its formal title, *Geocoding Health Data*. This monograph is broadly applicable to all research involving health data, whether administrative (e.g., vital statistics, communicable diseases, disease registries, etc.) or clinical in nature. The methods, techniques, challenges, and solutions described apply equally to all public health and clinical data sources, and other social services data as well, for that matter. Given this broad applicability, GIS instructors and students will find this book a useful tool for teaching and reference purposes. *Geocoding Health Data* will prove to be an invaluable resource for all epidemiologists and medical geographers interested in unlocking the potential of their data sources for mapping and spatial analysis.

**Mapping Manifest Destiny: Chicago and the American West: Exhibition at the Newberry Library
November 3, 2007 – February 16, 2008**

Curated by Michael P. Conzen and Diane Dillon

Published in 2007 by Newberry Library
Chicago, Illinois

119 pages, with color reproductions of historic maps throughout

\$27.95 softcover

ISBN 978-0-911028-81-2

*Reviewed by Mary L. Johnson, Technical Writer, Remington & Vernick Engineers, Haddonfield, New Jersey
www.rve.com*

The Newberry Library in Chicago maintains a large collection of historical maps. As part of the annual Festival of Maps, one hundred of these maps were organized into an exhibition called *Mapping Manifest*

Destiny: Chicago and the American West, which was on display at the Newberry Library from November 2007 through February 2008. Michael P. Conzen and Diane Dillon were co-curators of the exhibition as well as co-authors of this, its companion book.

Mapping Manifest Destiny: Chicago and the American West reminds us that the centers of mapmaking in the United States were originally the larger East Coast cities such as Philadelphia, New York, and Boston. But as our nation expanded westward, so did map production. Chicago became the national leader in the mass production and marketing of many important maps following the Civil War and remained so through much of the twentieth century.

This book explores both public and private mapping sectors, reasoning that maps produced by public entities are generally created to advance the nation's interests overall, whereas maps produced by the private sector are more likely to assist with business or educational pursuits. The public sector is presented in the first two sections of the book, and the private sector is presented in the last two sections of the book. As map producer, the city of Chicago remains the common thread that binds public and private sectors together.

Section One, *Maps for Empire*, begins with the earliest mapping examples of the American West, which were created to encourage or document exploration. Maps were used to establish boundaries and lay claim to North American land by European powers during the fifteenth and sixteenth centuries in the same way they would later be used by Americans during the westward expansion.

A Renaissance Sailor's View of the Americas is the first map shown in Section One. This map was originally drawn in 1529 and demonstrates that "west" was a concept that evolved over time. The eastern seaboard of North America is mapped in striking detail, but the western expanse of land is left largely uncharted. The uncharted space is beautifully decorated with compass roses, trees, and animals, and almost begs to be further explored.

Two historic maps and a painting of a New Mexican pueblo provide a glimpse of the Native American influence on westward expansion. Native Americans were a vital source of geographic data for European explorers and settlers for many years. Unfortunately, much of this knowledge was ultimately used to subjugate the Native Americans, as further illustrated in Section Two.

Spanish, French, British, and Russian territories are also depicted. Unlike their west European counterparts, Russian explorers charted the North Pacific from west to east, and their interest in the land was driven more by fur trading than a desire for permanent colonies.