


 reviews

**The Dartmouth Atlas of Health Care.** The Center for the Evaluative Clinical Sciences, Dartmouth Medical School. John E. Wennberg, Principal Investigator and Series Editor, Megan McAndrew Cooper, Editor. Chicago, Illinois: American Hospital Publishing, Inc., 1996. Pp. xiv + 230, maps, graphs, tables. \$75 (soft-cover, academic discount, without diskettes); \$350 (hardcover, with diskettes); \$1,300 (hardcover, with diskettes, CD-ROM, and all nine regional supplements). ISBN: 1-55648-163-2, soft-cover. (Ordering information: AHA Services, Inc., P.O. Box 92683, Chicago IL 60675-2683, 1-800-AHA-2626).

Reviewed by:

Russell S. Kirby, Ph.D., M.S., F.A.C.E.,  
Associate Professor  
Department of Obstetrics and  
Gynecology  
Milwaukee Clinical Campus,  
UW-Madison Medical School

Every now and again a revolutionary approach to the processing and presentation of information appears, changing forever the way in which the subject matter is viewed and understood. The publication of *The Dartmouth Atlas of Health Care* may be an example of one of these events. In this slender volume (this reviewer examined the soft-cover academic version of the atlas; hardcover and electronic versions are also available), the project team has assembled numerous maps and vignettes representing statistical analyses of literally tens of millions of health care services, patients, and clinicians in a highly readable and interpretable format. The atlas portrays the current macro-scale spatial structure of the American health care delivery system and displays patterns of disease prevalence and treatment modalities for

numerous health conditions and diseases. It may take a generation of medical geographers, epidemiologists and health services researchers to pursue all of the research questions, hypotheses and intuitive hunches derived from this single publication.

Most of the maps in the atlas display variations in health-related phenomena across hospital referral regions. These functional regions are aggregates of 3,436 hospital service areas which were defined through an intensive analysis of Medicare hospitalization data for 1992-93 in which five-digit ZIP codes were grouped into contiguous regions based on patterns of hospital use. A total of 306 hospital referral regions were identified through examining where residents of each hospital service area were referred for major cardiovascular surgery and neurosurgery. A series of detail maps show the locations of each hospital referral region in relation to major centers of health care (p. 25-35). Having defined the hospital referral regions, successive sections of the atlas provide detailed maps of acute care hospital resources and expenditures; hospital capacity, utilization, and outcomes; health manpower (physicians); diagnosis and surgical treatment of common medical conditions.

There are also sections on benchmarking, tabulations of much of the data presented in the detailed maps, and the strategies and methods used to develop the information and maps in the atlas. Most of the maps consist of two facing pages, with a standard layout that includes a national map with five insets (San Francisco, Chicago, Detroit, Washington-Baltimore, and New York) with the distribution of values for the phenomenon of interest grouped roughly into quintiles. Each discussion also includes a distribution graph showing the phenomenon of interest as the vertical axis and each hospital referral region represented as a filled circle

of equal size. These graphs show not only the degree of dispersion, but also whether variation is due to relatively few outliers or is widely distributed across the nation. The text accompanying each map focuses on which hospital referral regions had high and low rates, but provides little interpretation of the data displayed. Some context is provided elsewhere. For example, prior to the section on spatial patterns in the diagnosis and surgical treatment of common medical conditions, there is a discussion of "which surgical rate is right?" and the issues of underservice and the role of scientific uncertainty in the delivery of health care services.

While *The Dartmouth Atlas of Health Care* is an impressive achievement, it is not without its shortcomings. Foremost among these is the failure to include a bibliography would link the methods used to the literature on health services research and medical geography, and would connect each statistical map to its empirical research base. To aid in interpreting the maps with data across hospital referral regions, a map showing populations in each region would have been useful. Most of the disease and treatment data are derived from the Medicare population, which is defined primarily by age and almost universal participation. Researchers interested in patterns of health care use among individuals under the age of 65 will be disappointed in the minor omission of maps for more than 80% of the population. There are no maps showing patterns of injury or disability, survival following specific treatments, obstetrical procedures and outcomes, or spatial variation in propensity to use inpatient facilities among the non-elderly. This omission is perhaps understandable, given the lack of standardized, nationwide population-based databases on hospital services other than Medicare, yet there are some datasets (national vital statistics

data, for example) which, although not wholly satisfactory for analyses at this scale, could supply data with which to address some of these issues. The section on benchmarking, while interesting, is far too abbreviated to be of use to those interested in applying these techniques to the planning or evaluation of regional health care delivery systems.

These criticisms notwithstanding, this atlas is a monumental accomplishment which all practitioners of health services research or medical geography will wish to examine. Geography and map libraries should definitely add this volume to their holdings, and will find the hardcover edition consulted frequently. Spatial data repositories should consider acquiring the CD-ROMs with the detailed data used to generate the maps and graphics included in the atlas.

This reviewer looks forward to the linkage of spatial analyses of variations in health care delivery to decision-making by health care organizations, insurers, policy-makers and health services researchers, and to expanded and updated future editions of this atlas.

### Mapping an Empire: The Geographical Construction of British India, 1765-1843.

Matthew H. Edney. Chicago: University of Chicago Press, 1997. Pp. xv + 340, maps, references, biographical notes, and index. \$35.00 hardback (ISBN 0-226-18487-0).

Reviewed by:

Dr. W. Elizabeth Jepson  
Department of Geography  
University of California at Los Angeles

Enlightenment ideals, brute colonial realities, and practical bureaucratic negotiations collide in Matthew Edney's history of cartographic practice during late eighteenth and early nineteenth-century

British imperial expansion in South Asia. Considering recent studies on the duplicitous role of geography in European colonialism, it is not surprising that Matthew Edney has closely investigated cartography in British India. His contribution to the study of geography and empire is to present a sophisticated explanation of mapmaking in British India as a cultural, political, and historical product. Rather than a ubiquitous tool for empire, mapmaking in the divided bureaucratic context was confined, often contradictory, and incomplete. The author's narrative brilliantly synthesizes text and context—map and motive—to tell a story of how the British mapping of India was contingent on a variety of competing practical and ideological interests. Throughout this book, Edney deploys a rigorous theoretical analysis on voluminous archival material to illustrate the central theme in *Mapping an Empire*: A tension between Enlightenment epistemological ideals of observation and notions of representation were manifested through the actual practices of survey and mapmaking "on the spot." Moreover, this cartographic project based on intersecting ideologies of colonialism and contradictory ideals of science was mediated through colonial institutional negotiation and historical contingencies.

The first section of *Mapping an Empire*, Edney draws from many empirical examples to outline how overarching Enlightenment ideas and cultural expectations of "science" influenced colonial practices of mapmaking in the early years of British colonialism in South Asia. For example, the reports by "peripatetic officers" surveying the Indian landscape, such as Colin Mackenzie's Survey of Mysore (1800-1801) and Francis Buchanan's Bengal survey (1807-1814), attempted to achieve the ideal of taking a complete inventory. Survey of town locations, land resources, and rivers, descriptions

of language and religion, social and economic information, mineralogical, botanical and zoological inventories were predicated on the notion that the surveyor could achieve a complete scientific understanding of the landscape through this implicitly cartographic and visual framework. According to Edney, observation and reason provided a "powerful rhetoric of vision, empiricism, and presence" that buttressed the scientific authority of imperial cartography (p.75). This cultural and ideological expectation that science must be a rational process of compilation set the groundwork for the construction of what Edney names as the geographical "archive." This "archive" includes representations, images, narratives, and maps assembled and ordered that underpinned the larger cultural process of colonialism.

Scientific expectation also framed the conceptual scope, process and practice of colonial mapmaking. Edney illustrates how the British understood vision and observation in the scientific process. He argues that scientific investigation was an exercise of power, explains how the picturesque landscape aesthetic fashioned images of South Asia, and outlines how an implicit cartographic framework structured geographical narratives that contributed to the colonial archive. Emphasizing the cultural and scientific influence of the cartographic perspective on more general imperial information gathering activities, the author observes that "geographical observation implicitly constructs new knowledge based on the spatial and distribution of phenomena, in which respect is firmly rooted in the map and mapmaking, but observation itself is part of the larger knowledge discourses constituted by texts, maps, images, and statistical censuses" (p. 46). Through his broad overview of British cartographic history in South Asia, Edney sup-