Chapter X

Geographic Information Systems in Health Care Services

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Abstract

Geographic information systems (GIS) have numerous applications in human health. This chapter opens with a brief discussion of the three dimensions of decision-making in organizations — operational control, management control, and strategic planning. These dimensions are then discussed in terms of three case studies: a practice-improvement case study under operational control, a service-planning case study under management control, and a research case study under strategic planning. The discussion proceeds with an analysis of GIS contributions to three health care applications: medical/disability services (operational control/practice), emergency response (management control/planning), and infectious disease/SARS (strategic planning/research). The chapter concludes with a cross-case synthesis and discussion of how GIS could be integrated into health care management through Spatial Decision Support Systems and presents three keys issues to consider regarding the management of organizations: Data Integration for Operational Control, Planning Interorganizational Systems for Management Control, and Design Research for Strategic Planning.

Introduction

Geographic information systems (GIS) have numerous applications in human health. At the most basic level, entire research and practice domains within health care are strongly grounded in the spatial dimension (Meade & Earickson, 2000). Indeed, the pioneering work of Dr. John Snow in diagnosing the London Cholera Epidemic of 1854 not only launched the field of epidemiology, but did so in a manner closely linked with the visual display of spatial information (Tufte, 1997). The health care enterprise has become much more complex since the time of Dr. Snow and so have the technologies that are employed to conduct spatial analysis regarding heath care conditions and services (Dangermond, 2000).

This chapter opens with a brief discussion of the three dimensions of decision-making in organizations — operational control, management control, and strategic planning. These dimensions are then discussed in terms of the case study focus of the chapter, which includes a practice-improvement case study under operational control, a service-planning case study under management control, and a research case study under strategic planning. The chapter proceeds with the analysis of GIS contributions to three health care applications: medical/disability services (operational control/practice), emergency response (management control/planning), and infectious disease/SARS (strategic planning/research). The chapter concludes with a cross-case synthesis and discus-

Figure 1. John Snow's Map of the Broad Street Pump Outbreak, 1854[1]

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