

# **Introduction**

## Introduction

The tools used to measure and explore variation in this edition of the Atlas will be familiar to most readers. We have again based our measurements on the experience of populations — how health care is used by defined populations, rather than the physical location of health care resources. This methodology, which is generally known as small area analysis, is at the core of our work. Readers who are unfamiliar with the strategies of studying population-based rates of resource distribution and utilization are urged to read the Appendix on Methods.

The first task of the Atlas project, undertaken in 1993, was to establish the geographic boundaries of naturally-occurring health care markets in the United States. Based on a study of where Medicare patients were hospitalized, 3,436 geographic hospital service areas were defined. The hospital service areas were then grouped into 306 hospital referral regions on the basis of where Medicare patients were hospitalized for major cardiovascular surgical procedures and neurosurgery, markers for regionalization. In this Atlas, some measures of medical resources and utilization are reported at the level of hospital service areas (those resources and services which are more common and for which data is sufficiently rich to provide statistical stability even for relatively small areas) and at the level of hospital referral regions, which are used in cases where the number of events (for example, open heart surgery) is relatively small.

One important finding was that most hospital service areas and hospital referral regions, as defined by where patients actually receive their care, correspond poorly to political configurations, such as counties, which have traditionally been used to measure health care resources and utilization. Readers are referred to the series of maps of Michigan hospital service areas and hospital referral regions. It is important to note that many of these areas include geographic areas of neighboring states, although the rates of resources and utilization reflect only the experience of members of Blue Cross Blue Shield of Michigan who reside in Michigan.

**About Rates in the Atlas**

In order to make comparisons easier, all rates in the Atlas are expressed in terms that result in at least one digit to the left of the decimal point (e.g., 1.6 cardiologists per 100,000 residents, 3.9 hospital beds per 1,000 residents). In order to achieve this result, different denominators were used in calculating rates.

The levels of supply of hospital beds and hospital full time equivalent employees are expressed as beds and employees per 1,000 residents of the hospital referral region, based on American Hospital Association and Census data.

The numbers of physicians providing services to residents of hospital referral regions are expressed as physicians per 100,000 residents, based on American Medical Association and American Osteopathic Association data and census calculations.

The numbers of surgical and diagnostic procedures performed are expressed as procedures per 1,000 BCBSM members in the hospital referral region, or as procedures per thousand adult, child, or female members in the region — for procedures like tonsillectomy or mastectomy that apply to particular age or sex groups or groups of BCBSM members, such as those who have a pharmacy benefit. Patient day rates are expressed as total inpatient days per 1,000 BCBSM members.

**Making Fair Comparisons Between Regions**

Some areas of the country have greater needs for health care services and resources than others; for example, in some communities in Florida, as many as 60% of residents are over 65. Other parts of the country — including some with large college populations, or ski resorts — have much large proportions of younger people. To ensure fair comparisons between areas, all rates in the Atlas have been adjusted to remove the differences that might be due to the different age and sex composition of local populations. This adjustment avoids identifying some areas as having high rates of utilization simply because of their larger proportions of elderly residents.

The methods used to adjust for age, sex, race, illness and price of medical care are detailed in the Appendix on Methods.

**Communicating With Us About the Atlas**

Our Atlas Home Page on the World Wide Web contains Atlas information, including a summary of Dartmouth-related research and electronic copies of some hard-to-find references. Please send us your comments on the Atlas, particularly suggestions on how to improve it in the future.

We are at <http://atlas.dartmouth.edu>. The Dartmouth Atlas of Health Care in Michigan can also be viewed at [www.bcbsm.org](http://www.bcbsm.org).