California Variations in Medical Practice as reported by The Dartmouth Atlas of Health Care 1999

January 2000
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Table of Contents

Introduction ................................................................................................................... 1

Methodology of the Dartmouth Atlas of Health Care Study ................................. 3

Variations in Preventive Services ................................................................................. 5

Annual Blood Glucose Testing for Diabetics ............................................................ 6
Screening for Colorectal Cancer .................................................................................. 8
Screening for Breast Cancer ....................................................................................... 10

Variations in Diagnostic and Surgical Treatment .................................................. 13

Mastectomies for Breast Cancer ............................................................................... 14
Partial Mastectomies for Breast Cancer .................................................................... 16
Back Surgery Procedures ............................................................................................ 18
Heart Bypass Surgery .................................................................................................. 20
Coronary Angiography Procedures .......................................................................... 22

Variations in Care at the End of Life ......................................................................... 25

The Likelihood of Being Admitted to an Intensive Care Unit During the Terminal Hospitalization ........................................................................................................... 26
Average Number of Visits to Medical Specialists During the Last Six Months of Life ................................................................................................................................. 28

Conclusions ................................................................................................................. 31
Introduction

The Dartmouth Atlas of Health Care Project began in 1993 at Dartmouth Medical School’s Center for the Evaluative Clinical Sciences. Led since its inception by John E. Wennberg, M.D., M.P.H., the Atlas was the first national study of its kind. It uses statistical data from the Medicare fee-for-service program to seek a better understanding of variations in the distribution and utilization of medical resources in the United States.

The Dartmouth Atlas unveiled surprising differences in how health care is delivered in different regions of the nation.

Dr. Wennberg’s research in variation has provided a greater understanding of the potential causes of this phenomenon. These include differences in resource supply, differences in physician preferences, and the failure to incorporate patients’ preferences into the medical decision-making process. His work has raised significant questions about the outcomes and value of health care.


The U.S. Health Care Financing Administration (HCFA), which administers the Medicare program, excludes certain records from its Medicare population database; Dartmouth excluded the same kinds of cases, to ensure consistency of data analysis. Thus, those excluded from the Dartmouth analysis are: Medicare enrollees who were under age 65 or over age 99; Medicare enrollees who were enrolled in a risk-bearing HMO; patients who had been hospitalized more than 365 days; and hospitalizations in psychiatric, rehabilitation or long-term care units.

The exclusion of Medicare enrollees in HMOs is significant for California, where 39 percent of the state’s 3.9 million Medicare beneficiaries are enrolled in managed care plans. However, the data is still relevant for examining variations within California and nationwide, for the populations included in the Atlas data base.

Dr. Wennberg is a pioneer in the study of variations and outcomes of medical interventions. He is a member of the Institute of Medicine of the National Academy of Science and the Johns Hopkins University Society of Scholars. He has received a number of awards, including the Association of Health Services Research’s Distinguished Investigator Award, the Baxter Foundation’s Health Services Research Prize and the Richard and Hinda Rosenthal Foundation Award in Clinical Medicine. With colleague Alan Gittelsohn, he developed a strategy for
studying the population-based rates of health resource allocation and utilization, known as small area analysis, which has become a widely accepted methodology in the study of variation.

This report, based on the findings of the *Atlas*, examines the issue of variations in practice in the state of California. The report is divided into three sections:

- The first section covers variations in preventive services;
- The second section covers variations in diagnostic and surgical treatments;
- The third section covers variations in care at the end of life.
Methodology of the Dartmouth Atlas of Health Care Study

The Dartmouth Atlas of Health Care uses “small area analysis” and population-based research to examine variations in the delivery of health care in the United States. Small area analysis is a proven methodology that focuses on the experience of a population rather on what is happening at a specific hospital. Population-based research helps us understand what care is being provided to specific populations.

Most hospitals track the levels of care they provide and some outcomes; i.e., how many admissions, surgeries, or deaths they have during a period of time. But this allows only a narrow view of the health care market. The Dartmouth Atlas looks at data from a wider perspective, that of the actual population being served.

These methods have several advantages. The population density of an area is taken into account, which allows for apple-to-apple comparisons across the country. The data can then be used to answer the question of whether more care equals better care. Do populations that receive a higher level of back surgery fare better than those that are treated with physical therapy instead of surgery? Also, to increase the ability to fairly compare across the country, Dartmouth adjusted all usage rates to account for differences in age, sex, race, and illness.

The first step in performing a small area analysis is to define the geographic areas for study. Often these areas are defined by political boundaries, such as county or state lines. However, as people often cross these boundaries to seek care, Dartmouth felt that using political boundaries would not provide an accurate picture of the health care market. Instead, they defined two natural market areas, hospital service areas (HSAs) and hospital referral regions (HRRs). Hospital service areas are where patients seek general or local care. However, many local hospitals are not equipped to perform major surgery and refer patients to larger hospitals for this type of care. Hospital referral regions are where patients are referred for major procedures, such as heart surgery and neurosurgery.

Hospital service areas and hospital referral regions were defined in three steps. First, hospitals were identified and assigned to the city or town where they were located. Second, Medicare records were analyzed for the patient’s ZIP Code and the hospital where they were admitted. If a city or town had more than one hospital, the number of patients admitted to each hospital was added together. The ZIP Codes were then assigned to the HSA or HRR where the majority of patients living in that ZIP Code were admitted. Finally, the HSA or HRR definitions were visually inspected, and some ZIP Codes were reassigned to make sure individual HSAs and HRRs were contiguous.
Dartmouth then used population-based research to “allocate” care to the populations in HSAs and HRRs. The Atlas focuses on the population, where they live, and the care they receive, no matter where it occurs. The majority of care a population receives is local, but these methods also address what is termed “patient migration” (seeking care outside of the immediate area), thus providing a complete picture of the levels of care a population experiences.

All rates of care in the Atlas represent the number of discharges for Medicare beneficiaries in the population. As HCFA excluded certain cases from its Medicare population totals for any area, Dartmouth excluded the same kinds of cases. This included Medicare enrollees who were under age 65 or over age 99, Medicare enrollees who were enrolled in a risk-bearing HMO, patients who had been hospitalized more than 365 days, and hospitalizations in psychiatric, rehabilitation or long-term care units.

All of the rates reported by the Dartmouth Atlas have been proven to be statistically significant—the variation reported by the study is real, and not due to chance. Any data that was outside of a 95 percent confidence interval was “suppressed,” meaning it was omitted from the maps, and appears as white areas on all maps.
To determine the quality of preventive services in the United States, the Atlas measured compliance levels of guidelines established by the Diabetes Quality Improvement Project and the U.S. Preventive Services Task Force. Although these recommendations have been proven to reduce rates of illness or death, Dr. Wennberg and his team found very low rates of compliance across the country among the Medicare population.

The Diabetes Quality Improvement Project
The Diabetes Quality Improvement Project (DQIP), formed in 1997, is dedicated to the improvement of diabetes care in the United States. The project is organized by a coalition of four organizations: the American Diabetes Association (ADA); the Foundation for Accountability (FACCT); HCFA; and the National Committee for Quality Assurance (NCQA).

The project seeks to establish a nationally accepted set of measures for diabetes care that could be used as an indicator for quality of care across the country. Accountability measures were developed that were based on scientific evidence, had consensus support from the scientific and medical community, and had been field tested in a variety of settings. The American Diabetes Association and the Foundation for Accountability have adopted these measures for use in the ADA Physician Recognition Program and the FACCT Accountability Measure Set.

The U.S. Preventive Services Task Force
In 1996, the U.S. Preventive Services Task Force, an independent advisory panel constituted by the U.S. Department of Health and Human Services, established guidelines for immunization and screening for disease. Its goal was to assist physicians by determining which immunizations or tests were most effective, and establishing guidelines for their administration. In order for a screening test to be included in the guidelines, the disease tested for must be widespread; there must be an effective treatment for the disease; a physician must be able to perform the test during a routine examination; the test must be accurate and detect disease before a physician could in an examination; and early treatment of the disease had to increase the likelihood of a good outcome.
Monitoring of glucose, or blood sugar levels, is considered to be “a cornerstone of diabetes care” by the American Diabetes Association. Diabetics who are able to maintain normal or near-normal blood glucose levels experience fewer complications, such as blindness, kidney failure, amputation, and heart disease.1

The Diabetes Quality Improvement Project recommends routine monitoring of blood glucose either through self-monitoring, or monitoring by a care provider. The Atlas reported a more than eight-fold variation across the country in 1995-96, with between 8.9 percent and 70.2 percent of diabetic Medicare enrollees receiving an annual glucose test.

Glucose monitoring of diabetics was more common among Medicare residents of the West, Midwest, and Florida. Included in the nation's ten highest regions for glucose testing were Sun City and Mesa, AZ (67.2 percent, 62.3 percent); Salem, OR (66.7 percent); and Idaho Falls, ID (70.2 percent).

Shreveport, LA (14.7 percent), York, PA (8.9 percent), and Tupelo, MS (16.3 percent) were among multiple regions in Louisiana, Mississippi, and Pennsylvania where fewer than 20 percent of diabetic Medicare enrollees received annual glucose screening.
Hospital referral regions within the state of California showed more than a two-fold variation, with 22 percent to 51.2 percent of diabetic enrollees tested. Seventy-five percent of California hospital referral regions had glucose testing compliance rates above the national average (35.6 percent).

In both Santa Barbara and Ventura, more than 50 percent of diabetics received glucose testing, while surrounding regions of Los Angeles, Bakersfield, and San Luis Obispo tested between 34 percent and 39 percent of diabetic enrollees.

Contra Costa County (37.2 percent), Bakersfield (38.6 percent), Fresno (40.1 percent), and Alameda County (40.7 percent) had compliance rates close to the state average of 39.6 percent. San Francisco’s hospital referral region had the fourth-lowest rate in the state (32 percent), followed by Napa, Palm Springs, and Stockton.

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Screening for Colorectal Cancer

Colorectal cancer is the second most common form of cancer in the United States, and accounts for approximately 55,000 deaths a year. The lifetime risk of contracting colorectal cancer is 2.6 percent. The five-year survival rates for colorectal cancer are 91 percent in persons with localized cancer, 60 percent in persons with regional spread near the colorectal area, and only 6 percent in those where the cancer has spread to distant areas. Approximately 60 percent of persons with colorectal cancer have regional or distant spread of the cancer at the time of diagnosis.2

The Preventive Services Task Force recommends annual screening for colorectal cancer for all persons aged 50 or older. The Dartmouth Atlas reported low rates of screening across the country, ranging from 2.4 percent to 22.2 percent of Medicare enrollees screened, with a national average of 12.3 percent.

Although compliance rates were below the recommended guidelines, Salinas, CA ranked third highest in the nation, with 22 percent of its enrollees receiving screening, exceeded only by Fort Lauderdale, FL and Takoma Park, MD. South Carolina, Michigan, and regions in New England also showed higher than average screening rates. Colorado, Indiana, Louisiana, and Utah contained more than one region with a colorectal cancer screening rate of lower than 5 percent.
Twenty-one of the state’s 24 hospital referral regions had colorectal cancer screening rates above the national average. Rates varied more than two-fold within California, from 10.4 percent to 22 percent of Medicare enrollees screened.

The Salinas, Ventura, and Santa Barbara referral regions all had cancer screening rates in the highest 95 percentile of the nation. Between 16 percent to 19 percent of enrollees received screening in Palm Springs, Orange County, Fresno, and San Diego.

Los Angeles (15 percent), San Mateo County (15.3 percent), San Francisco (15.5 percent), and Sacramento (15.7 percent) referral regions showed rates close to the state average of 15.2 percent of Medicare enrollees screened in 1995-96.

Many of the lowest rates in the state were located inland or in the northern part of the state: San Bernardino (10.4 percent), Stockton (11.2 percent), Napa (12.1 percent), Redding (12.5 percent), Bakersfield (12.9 percent), and San Jose (13.1 percent).

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Breast cancer constitutes 32 percent of all newly diagnosed cancer in women, and is surpassed only by motor vehicle accidents and infections in potential loss of life. The lifetime risk a woman has of contracting breast cancer is 3.6 percent, with the majority of breast cancer deaths occurring in women aged 65 or older. As women in the “baby boom” generation age, the number of breast cancer cases will only increase unless the incidence of breast cancer in older age groups is decreased.

The Preventive Services Task Force recommends screening for breast cancer every one to two years for women aged 50-69. As the Atlas used data for the Medicare population in its study, breast cancer screening rates for women aged 65-69 were measured to evaluate compliance with the guideline.

The Dartmouth Atlas reported strong variation patterns in U.S. breast cancer screening in 1995-96. Women in Florida and Michigan tended to receive more mammograms than women in the rest of the country; some areas in the Northeast also performed relatively high rates of mammograms. The highest rate of compliance in the nation, Traverse City, MI, screened 50 percent of its Medicare women, and Michigan was the only state where the majority of referral regions screened 35 percent or more of female enrollees. More than one fourth of the nation’s regions had screening rates of 25 percent or lower.
In California, between 20 percent to 37 percent of Medicare women aged 65-69 received mammograms in 1995-96. Two referral regions, Santa Cruz and Chico, screened more than 35 percent of women. Redding, Orange County, Stockton, San Luis Obispo, and Palm Springs referral regions screened between 30 percent and 35 percent of female Medicare enrollees.

Bakersfield, Salinas, and Santa Rosa referral region’s rates were close to the national screening rate average of 28.3 percent. Sacramento, Contra Costa County, San Mateo County, and San Diego referral regions had screening rates within 2 percent of the state average, which was 26.6 percent.

The five referral regions with the lowest rates in the state were San Bernardino (24.2 percent), Los Angeles (23.6 percent), San Francisco (22.3 percent), San Jose (21.4 percent), and Alameda County (20.9 percent).

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Variations in surgical care have long been recognized and discussed in medical literature. However, not all surgical procedures are equally variable. For example, rates of hip fracture repair show low levels of variation, while rates of heart bypass surgery show much higher variation.4

What distinguishes low-variation from high-variation surgery? Dr. Wennberg feels that, in general, low-variation procedures are treatments that most physicians agree upon for a given condition, and in which the patient and the doctor also agree upon the same treatment. High-variation procedures involve more physician discretion in making a choice of treatment either because of inadequate science to prove which treatment is best, or because of a failure to take patient preferences into account.

Dr. Wennberg defines “quality” in health care as “doing the right things right.” He points out that traditional efforts to improve the quality of surgical care have largely concentrated on improving surgical performance—or “doing things right.” This is much easier to measure, with either mortality or complication rates, and provides more obvious solutions for improvement, such as increased operating skills or improved post-surgical care.

Improving quality by “doing the right things right” is much more difficult and confusing. To measure this aspect of quality, it is necessary to ask whether the initial decision to treat with surgery was correct. Often, medical science is inadequate to provide definitive guidelines on which treatment is likely to provide the best outcome for a patient. Thus, rates of treatment vary because physicians disagree about the effectiveness of surgery. Sometimes guidelines are available, but the treatment choices have different risks and benefits, which only the patient can assess. In these cases, variation may be caused by a failure to take patient preferences into account.

The study of variation in diagnostic and surgical care assists in identifying areas for improvement of quality in physician treatment choice and in accounting for patient preferences. Although variation patterns do not answer the question of which rate is best, they provide a clearer picture of the type of treatment that is being administered.

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Surgery is a major method of treatment for breast cancer. There are two principal types of surgery available: partial mastectomy, where only a portion of the breast is removed (followed by radiation therapy), and a full mastectomy, where the breast is completely removed. Clinical trials have shown that these two approaches have nearly identical rates of cancer cure.\(^5\)

Because both of these methods have the same success rate, treatment choice is a matter of preference, not science. However, wide variations in surgical rates for both of these procedures suggest that physician, not patient, preferences are the deciding factor in most cases.

Rates of mastectomies varied four-fold across the nation, from 0.9 to 3.6 procedures per 1,000 female Medicare enrollees. Many of the hospital referral regions with high rates of mastectomies were located in the northern and central parts of the United States. Virtually all regions in North Dakota, South Dakota, Minnesota, Iowa, and Kansas had rates at or above 2.43 procedures per 1,000 female enrollees.
Twenty percent of California hospital referral regions had rates of mastectomies above the national average. California’s rates varied two-fold across the state, from 1.23 to 2.57 procedures per 1,000 female Medicare enrollees. Both Modesto (2.57) and Napa (2.50) were among the 50 highest regions in the country, followed by Chico (2.35), San Luis Obispo (2.22), and Salinas (2.00).

The Bakersfield, Santa Rosa, and San Bernardino referral regions were slightly lower than the national average of 1.96 procedures per 1,000 female enrollees. Los Angeles (1.65), San Diego (1.54), and Alameda County (1.41) had rates lower than the national average. San Francisco had the lowest rate in the state, and the seventh-lowest rate in the nation (1.23 procedures per 1,000 female enrollees).

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Mastectomies for Breast Cancer
per 1,000 Female Medicare
Enrollees in California
by Hospital Referral Region (1995-96)

Partial Mastectomies for Breast Cancer

Although some of the rates for partial mastectomies were not used, to maintain the Atlas’ statistical confidence levels (see Methodology), widespread variation could be seen throughout the United States. The majority of breast-sparing surgery was performed in the Northeast and California. The New York (1.09), Philadelphia (1.06), and Takoma Park, MD (1.01) hospital referral regions were among the highest rates in the country.

The Boston, Arlington, Miami, Fort Lauderdale, Denver, and Tucson hospital referral regions all had rates close to the national average of 0.6 partial mastectomies per 1,000 female enrollees. Referral regions with low rates included Salt Lake City (0.37), Orlando, FL (0.36), El Paso, TX (0.28), and Mesa, AZ (0.24).
Rates of breast-sparing surgery in California varied by a factor of approximately three, from 0.26 to 0.74 procedures per 1,000 female Medicare enrollees. Los Angeles (0.72), Santa Rosa (0.74), Ventura (0.71), San Bernardino (0.69), Orange County (0.68), and Sacramento (0.64) were in the top 25 percent of the highest rates of partial mastectomies in the nation.

Almost 40 percent of California hospital referral regions had rates of breast-sparing surgery below the national average. Alameda County, Fresno, and San Diego had rates close to the national average. San Jose (0.45), San Francisco (0.40), and Redding (0.26) performed the lowest number of breast-sparing surgeries in California in 1995-96.

* Any data that was outside a 95 percent confidence level was omitted.
There is little known about the effectiveness of back surgery for back pain. Outcomes of back surgery have not been established by randomized clinical trials, and little is known about the natural history of back pain treated without surgery. To further confuse the issue, many X-rays show spinal abnormalities in patients without any back pain or neurological symptoms.6

It is not surprising that the Atlas reported large variations in back surgery procedures. Rates of back surgery varied more than five-fold across the country, from 1.31 to 7.26 procedures per 1,000 Medicare enrollees, with a national average of 3.06. Hospital referral regions in the Northwest and South performed more back surgeries than the rest of the country, with low rates of procedures in New England. Santa Barbara (6.46) had the third-highest rate in the nation, exceeded only by Fort Collins, CO (6.84), and Bend, OR (7.26). Newark, NJ (1.38), McAllen, TX (1.32), and Bronx, NY (1.31) had the lowest rates in the country.
Almost 40 percent of hospital service areas in California had rates of back surgery above the national average. Rates varied six-fold across California’s hospital service areas, from 7.20 (Glendora) to 1.16 (Daly City) per 1,000 Medicare enrollees. Ventura (6.72) and Santa Barbara (6.42) had some of the state’s highest rates.

Los Angeles (3.08), Stanford/Palo Alto (3.07), Riverside (3.06), and Los Alamitos (3.05) all had rates near the national average of 3.06. Many hospital service areas located in the Bay Area had some of the lowest rates in California: South San Francisco (1.61), Concord (1.63), Vallejo (1.89), and Oakland (2.40).

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* Any data that was outside a 95 percent confidence level was omitted.
Heart Bypass Surgery

Heart bypass surgery is one form of treatment for coronary artery disease. Other treatment options include diet, exercise, heart medications, and angioplasty. The decision to recommend heart bypass surgery depends on the severity of patient symptoms and underlying coronary disease.7

However, the variation in bypass surgery rates suggests that physicians have different symptom “thresholds” for recommending surgery. Additionally, lack of uniform interpretation of patient preferences by physicians, variation in patient discomfort associated with pain, and differences in patient preferences with regard to the risk of death or potential complications from surgery all contribute to the variation in the rate of heart surgery in the United States.

The Atlas reported that the rate of heart bypass surgery varied by a factor of more than 3.5, from 3.1 to 11.5, with a national average of 6.19 procedures per 1,000 enrollees. Generally, rates were lower in the Mountain states and higher in the Midwest and South.
Bypass surgery rates varied by a factor of almost six among California’s hospital service areas, from 2.37 to 13.55 procedures per 1,000 enrollees. The Redding service area’s rate was the highest in the state (13.55), and was 35 percent higher than the second-highest rate in the state, Mt. Shasta (10.07).

Approximately 70 percent of hospital service areas in California had heart bypass surgery rates below the national average average of 6.19 procedures per 1,000 enrollees, including Long Beach (5.98), Los Angeles (5.40), San Diego (4.42), San Francisco (4.27), and Oakland (3.97). Hospital service areas with the lowest rates in the state included Fallbrook (3.47), Stanford/Palo Alto (3.31), San Pedro (3.28), and El Centro (3.22).

* Any data that was outside a 95 percent confidence level was omitted.
Coronary Angiography Procedures

Coronary angiography is a diagnostic imaging procedure used to identify blockages in the blood vessels feeding the heart, and is considered to be an essential step in a physician's decision to recommend heart bypass surgery.

There was substantial regional variation in rates of coronary angiography in 1995-96. Rates of angiography varied four-fold across the country, from 41.11 to 9.83 per 1,000 Medicare enrollees. Referral regions in the South and Southeast tended to perform more angiography procedures than in the West. The two regions with the highest rates were in Louisiana. Other referral regions with high rates were Panama City, FL (27.88), Chicago (23.73), Pittsburgh, PA (22.95), and New Orleans (22.12).

Washington D.C. (15.54), New York (14.84), and Boston (13.76) all had rates well below the national average of 18.38. The Contra Costa County (13.04), Santa Rosa (13.0), San Francisco (11.64), and San Luis Obispo (11.18) hospital referral regions were among the lowest in the country.
California’s hospital service areas had an almost five-fold variation in rates of coronary angiography, from 7.92 to 38.76 procedures per 1,000 Medicare enrollees. There was no distinguishable pattern to the location of the rates, although San Francisco Bay Area localities tended to have lower rates than those in the Los Angeles and San Diego regions. Clearlake, Salinas, and Fall River Mills service areas had the highest three rates in the state, followed by Deer Park and Redding.

Eighty percent of California’s hospital service areas had rates below the national average of 18.38, with Los Angeles (18.21), Culver City (18.29), and La Mesa (18.31) performing angiography at levels close to the national average. Fairfield, Alameda, Fallbrook, Sonora, Madera, Novato, and Petaluma were among the lowest rates in the state, each performing fewer than 10 procedures per 1,000 enrollees in 1995-96.

* Any data that was outside a 95 percent confidence level was omitted.
Variations in Care at the End of Life

One of the most important questions that Dr. Wennberg poses in his research is, "Is more better?" Are patients who receive more care happier and healthier than those who are getting lower levels of care? Never is this question more important than at the end of a patient's life. As the Atlas notes, "The quality of medical intervention is often more a matter of the quality of caring than the quality of curing, and never more so than when life nears its end. Yet medicine's focus is disproportionately on curing, or at least on the ability to keep patients alive with life-support systems and other medical interventions." But is this the care that terminally ill patients would choose? To answer that question, the Atlas reviewed studies on patient preferences at the end of life. They reported that more than 80 percent of patients say they would prefer death at home if a doctor told them they had "very little time to live."

The Atlas found that care at the end of life is not determined by a patient's preferences or the power of care to extend life, but rather on where the patient happens to live. Like other medical decisions, end-of-life treatment decisions are influenced by the available supply of acute care hospital resources and by individual physicians' practice styles. The Atlas reports startling variations in end-of-life care among communities across the United States. But is more better? Do patients who receive more intensive treatment gain additional years of life? Research conducted in conjunction with the Atlas project provided evidence that populations living in regions with lower intensity of care in the last six months of life did not have higher mortality rates.⁸

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The Likelihood of Being Admitted to an Intensive Care Unit During the Terminal Hospitalization

One measure of the intensity of hospital care at the end of life that the Atlas analyzed was the likelihood that Medicare enrollees would be admitted to an intensive care unit (ICU) during the hospitalization in which they died.

The Atlas reported that the chance an enrollee who died in the hospital had of being admitted to an ICU during that hospitalization varied nationwide from less than 7 percent to almost 30 percent. Medicare enrollees living in the East, South, and parts of California were more likely to be admitted to an ICU than enrollees living in other parts of the West.

The Newark, NJ hospital referral region ranked number one in the nation with a rate of 29 percent. Other referral regions in the top 10 percent of the country included Miami (25 percent), Los Angeles (22 percent); New York (21 percent), and Philadelphia (20 percent). Referral regions in the bottom 10 percent of the country included San Francisco (13 percent); Portland, OR (11 percent); Salt Lake City (11 percent); and Sun City, AZ (7 percent).
The percentage of enrollees admitted to an ICU during a terminal hospitalization varied almost eight-fold among California’s hospital service areas, from 4 percent to 31.2 percent. Many of the highest rates in California were located in and around the Los Angeles hospital service area: Simi Valley (27.7 percent), Hawthorne (27.9 percent), Monterey Park (27.4 percent), Los Angeles (24.5 percent), Inglewood (23.4 percent), Long Beach (22.3 percent), and San Bernardino (21.1 percent).

The majority of areas where 10 percent or fewer enrollees were admitted were located in the Bay Area and Northern California: Vallejo, Walnut Creek, Martinez, Concord, Sonoma, Petaluma, Santa Rosa, Sebastopol, Willits, and Garberville.
Average Number of Visits to Medical Specialists During the Last Six Months of Life

The Atlas reported that more than 40 percent of Medicare enrollees’ visits with physicians during the last six months of their lives were with medical specialists. They also found that there was no evidence of a “substitution effect”—that enrollees were being seen by primary care doctors instead of medical specialists. In fact, regions with higher visit rates to primary care physicians also tended to have higher visit rates to specialists.

Medicare enrollees visited specialists more often in parts of Florida, Texas, and California and in regions between New York and Washington D.C. than in the rest of the country. Los Angeles had the highest visit rate in the nation, 21.2 visits, followed by Miami (20.6), McAllen, TX (18.7), and Takoma Park, MD (18.7). Other referral regions with high rates included Ventura (17.2), Philadelphia (14.9), and East Long Island (13.4). Referral regions with fewer than five visits included Salt Lake City, Portland, OR, and Minneapolis.
California hospital service areas showed enormous variation in visits to medical specialists in 1995-96. Specialist visit rates varied by a factor of 30 across California hospital service areas, from an average of 1.1 visits to 33.3 visits per enrollee.

Many of the service areas with the highest rates were located in Southern California. Service areas with high rates included Santa Monica (33.3), Los Angeles (28.7), San Pedro (24.4), and Anaheim (22.1).

Service areas with visit rates around the national average of 8.5 visits included San Francisco (9.5), Oakland (8.9), Sacramento (8.8), and San Jose (8.2). Although many of the hospital service areas with low visit rates were in Northern California, some areas were located close to or next to areas with high rates: La Jolla (6.7), Encinitas (6.6), Banning (4.4), and Ojai (4.1).
Conclusions

The 1999 *Atlas* shows that in health care, geography is destiny. As the *Atlas* concludes, “The amount of care consumed by Americans is highly dependent on where they live, on the capacity of the health care system where they live, and on the practice styles of local physicians.” While the *Atlas* has provided insight into how medical care is delivered in different regions of the United States, many questions remain unanswered. What is the right rate? How much is enough? Is more better?

It is difficult to understand why the system produces broad variation in medical practices where guidelines exist, as in the case of preventive services. We know what works in preventive medicine, but are uncertain why portions of our medical system routinely fail to provide services of demonstrated benefit. For example, the U.S. Preventive Services Task Force recommends breast cancer screening for all women aged 50-69. Yet only 20 percent to 37 percent of female Medicare enrollees in California were screened.

Variation in areas where there are no scientifically-based guidelines is more difficult to address. For example, the number of visits to medical specialists among Medicare enrollees during their last six months of life varied 30-fold across California’s hospital service areas—from an average of one such visit to 33; heart bypass surgery rates varied by a factor of almost six.

Dr. Wennberg suggests that education, discussion, and benchmarking among medical communities can help reduce these variations. This can include education of both physicians and patients and development of quality improvement projects that address differences in health care delivery.

In addition, other health care stakeholders can work to create incentives that will help promote best practices and lessen variations in practice:

- Government, health plans, provider organizations, measurers and other entities can support, where possible, the development and dissemination of standardized best practices for specific procedures and treatments;

- Purchasers can incorporate support of best practices into their decision-making, by contracting with providers that participate in measurement activities;

- Measurers can work together to standardize measures and report consistent data;

- Consumer organizations can lend their credibility and their expertise in policy and community organizing to efforts to minimize variation.

It is through these kinds of efforts that the questions raised by variations in practice can begin to be answered.
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