

The Dartmouth Atlas on Roemer's Law

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Dr. Milton I. Roemer first stated his "Law" in print in 1959 and 1961, most succinctly as: "A built bed is a filled bed." (Roemer, M.I. "Bed supply and hospital utilization: a natural experiment." *Hospitals*. 1961 Nov 1; 35:36-42.) Roemer's Law states that there is a direct correlation between capacity and utilization. With the availability of third-party reimbursement, oversupply of resources, especially hospital beds and specialist physicians, induces its own demand for their overusage. This principle became the major impetus behind comprehensive health planning and certificate of need regulation.

Tracking the Care of Patients with Severe Chronic Illness: The Dartmouth Atlas of Health Care 2008, John E. Wennberg et al,¹ was released in April. It is a rich resource for data (2001 through 2005) on the remarkable geographic variations in service utilization by those most costly to treat, Medicare patients in their last two years of life, and it documents the fragmentation as well as the overtreatment that attends services for the chronically ill. The care frequencies it documents vary by a factor of almost three times for overall cost as well as for primary care visits, by over four times for hospitalizations for congestive heart failure and chronic obstructive pulmonary disease, and by five times for visits to medical specialists.

The Atlas examines supply-sensitive care, about which it has this to say:

"Supply-sensitive care refers to services where the supply of a specific resource (e.g., the number of specialists per capita) has a major influence on utilization rates. Physician visits, hospitalizations, stays in intensive care units, and imaging services are all examples of care where the local supply influences the frequency of use. Variations in supply-sensitive care are largely due to differences in local capacity and a payment system that ensures current capacity remains fully deployed.

"The likely explanation for both the dramatic differences in spending and the strong correlations with supply lies in the lack of firm scientific evidence available to guide most clinical decisions; the general assumption among both physicians and patients that more medical care means better care; the marked variations in supply that emerge in an unplanned marketplace; and a fee-for-service payment system that rewards providers for staying busy. Physicians adapt their practice subliminally to the available resources."

The Atlas documents how hospitalization rates are strongly correlated with the local per capita supply of hospital beds. The cost of such variations – unrelated to quality – is great; if all regions had adopted the practice patterns observed for the most efficient regions, spending during 2005 for patients with severe chronic illness would have declined by over 25%, and the volume of services provided is a more important determinant of total cost than is the price paid for each service.

Three states – New Jersey, California, and New York – spent at a level that was more than 20% above the national average, and three states – North Dakota, Iowa, and South Dakota – spent at a level that was more than 25% below the national average.² Among 306 hospital referral regions, the three highest – Manhattan, the Bronx, and Los Angeles – exceeded spending in the three lowest – Mason City, Iowa, La Crosse, Wisconsin, and Dubuque, Iowa – by almost \$46,000 per patient. The degree of variation among regions located within a single state, New York, was nearly as great as that found among all hospital referral regions: more than \$75,000 per chronically ill decedent in the Bronx and Manhattan regions compared to \$36,824 in Rochester and \$33,271 in Binghamton.

The Atlas focused special attention on the five academic medical centers that *U.S. News & World Report* placed at the top of its 2007 Honor Roll for America's Best Hospitals. It found that the Mayo Clinic (St. Mary's Hospital) used 58.2 hospital beds and 18.4 ICU beds in care per its 1000 tracked patients, and it spent \$53,432 per patient (\$34,372 of that inpatient) during the last two years of life. At the opposite extreme among these five, UCLA Medical Center used 85.8 hospital beds and 38.1 ICU beds, and spent \$93,842 (\$63,900 inpatient). Further analysis revealed that UCLA's inpatient spending was 1.84 times that of the Mayo Clinic because its patients spent 47% more days in the hospital and reimbursements per day were 25% higher.³

Caring for people with chronic disease now accounts for more than 75% of all health-care spending, and one-third of Medicare dollars each year are spent on them during the last two years of life.⁴ If the spending per patient everywhere mirrored that in Mayo's home region of Rochester, Minnesota, Medicare could have saved \$50.1 billion over the five years on these patients alone. The data also suggest that reducing the overuse of acute care hospitals would not only save money, it could also help resolve the national shortage in the registered nurse workforce.

And worst of all, there is good evidence that the extra care given patients did more harm than good. In an earlier study,⁵ Dartmouth researchers found that patients in high-spending, aggressive-care regions waited longer in emergency rooms and doctors' offices than patients in lower-spending regions did. They were less likely to get recommended preventive treatments, such as aspirin to prevent future heart attacks, or appropriate immunizations. They were slightly more likely to die, and those who didn't die weren't any better off in terms of their ability to function in daily life. And overall they were no more satisfied with their care. Furthermore, a February 2008 study by the Congressional Budget Office found a reverse correlation between per capita Medicare spending and care quality.

The Dartmouth Atlas is recognized for its documentation of regional variation in medical practice, but its greater lesson lies in the national potential for vast economies in medical spending, economies that are impossible to realize due to the perverse incentives built into a for-profit delivery system. Any provider – physician or hospital – that achieves efficiency by reducing utilization thereby lowers its revenue and endangers its future.

In Los Angeles, Medicare spending during the last two years of life varied from \$130,992 per beneficiary at the most costly hospital to \$61,239 at the least expensive hospital. The Atlas researchers noted that “the excess resources available in Los Angeles seem to have no influence on capitalization decisions by administrators to add yet more beds and additional resources to the region’s hospitals....Instead of expanding, Los Angeles hospitals could strive to improve efficiency by *reducing* capacity.” The conclusion they reached from their data is:

“The single most important factor determining whether a community or a given care system and its associated physicians overtreats the chronically ill is the size of its acute care sector relative to the number of chronically ill patients who need treatment. In high-cost regions and health systems, providers have overbuilt their acute care sectors; lower cost systems and regions have been more frugal, using fewer hospital beds, less physician labor, and less of such expensive technologies as intensive care beds and medical imaging devices.”

Comparison of New York City’s public (8) and private (38) hospitals further reveals the marked disparity in use of resources in the last two years of patients’ lives. Care was far more intense and expensive in the private hospitals with their abundance of beds and specialists, but without apparent benefit to those patients who lived no longer. Much of the variance in practice patterns can be explained by the fact that about 80% of the physicians in the public hospitals, like those at the Mayo Clinic, are salaried, without the perverse incentive to overtreat.

¹ At: http://www.dartmouthatlas.org/atlas/2008_Chronic_Care_Atlas.pdf.

² New Jersey spent \$59,379 per patient; North Dakota spent \$32,523.

³ Consumers Union, the publisher of *Consumer Reports* magazine, is now rating hospitals online for their intensity of care (time spent in the hospital and the number of physician visits) based on Medicare data collected by the Dartmouth researchers. It will track the nine major medical conditions treated during patients’ last two years of life, and will include the related average out-of-pocket cost for physician visits. See <http://www.consumerreports.org/health/doctors-and-hospitals/hospital-home.htm>.

⁴ About nine out of ten Medicare deaths are associated with just nine chronic illnesses: congestive heart failure, chronic lung disease, cancer, coronary artery disease, renal failure, peripheral vascular disease, diabetes, chronic liver disease, and dementia.

⁵ E.S. Fisher, D.E. Wennberg et al, “The Implications of Regional Variations in Medicare Spending. Part 2: Health Outcomes and Satisfaction with Care,” *Annals of Internal Medicine* 138(4), 13 Feb. 2003: 288-298. <http://www.annals.org/cgi/content/full/138/4/288>.