The Wennberg Dartmouth Atlas Hoax

The Relation of Frailty and Poverty to Health-Care Needs

by Ned Rosinsky, M.D.

Dr. Ned Rosinsky, a psychiatrist, has spent many years studying the relationship of socioeconomic status to general health and welfare.

The population is enraged, and you can hear it in town meetings across the country. "Who are you, trying to take over my health insurance?," people yell at their Congressman. "How can I trust this bankrupt government that uses bailouts from the Chinese for government debt; that throws trillions of dollars at banks to bail out derivatives crapshoots? How can I trust this government to run my health care?" How indeed? The closer you look at the Obama plans, the more you wonder.

This is Part 2 of the closer look, the exposé of Obama budget czar Peter Orszag's so-called "plan" for how to pay for health care[1]. Orszag claims that one third of Medicare spending is waste, unnecessary expense. To back up this claim, he has one major source of information, The Dartmouth Institute for Health Policy and Clinical Practice, and the Institute's primary publication, the "Dartmouth Atlas of Health Care 2008." This is the source of Orszag's fraudulent claims, and this is where we need to look.

Part 1 of this expose, "Behind Obama's Nazi Health Plan," began with an appeal to the reader to get out of the box, to stop trying to fix health care within a collapsing economy. Under these conditions, pretty much anything you do will make it worse, like struggling in quicksand. Instead, put your energy into fighting for investment in infrastructure; create a tax policy that discourages, rather than encourages, the exporting of our factories and jobs; declare the derivatives debt holders bankrupt and write their bets off; and fully fund NASA space exploration and nuclear energy, both fission and fusion, which will pay back double or more to the economy through spinoffs. When we regenerate a healthy, industrial economy based on advanced science, we will be able to afford health care for all, in any number of insurance arrangements.

The current back-of-the-mind assumption that allows for "reasonable" public discussion, by the likes of Obama's health policy advisor Dr. Ezekiel Emanuel, of the merits of deciding whether a 2-year-old versus a 20-year-old should be allowed to die, is the assumption of limited resources. "We can't afford all this health care, so let's get together and decide who lives and who dies, and make it democratic." Democratic Nazism is what it is. Participatory Nazism.

But the proponents of the Dartmouth Atlas findings retort: "There is waste, there is money to be saved, and isn't this the time to look for savings, when the economy is tanking?" Sure, if the Atlas were correct—but it is not.

A Quick Review

To review the main points in Part 1, the 2008 Dartmouth Atlas begins with data on Medicare end-of-life health expenses for deceased people, the total billings to Medicare for the last two years of life, and focuses on the five-year period from the beginning of 2001 to the end of 2005. The Atlas makes the startling assumption that each of these people had exactly the same prognosis two years before death, because they all died exactly two years later. Therefore, those providers who spent more on their patients were wasteful, whereas those who spent less were more efficient. They all died anyway, so why spend so much money, the reasoning goes.

The Atlas divides the United States into 306 Hospital Referral Regions (HRR), each containing at least

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1. N. Rosinsky, "Behind Obama's Nazi Health Plan: Physicians Expose Wennberg Dartmouth Atlas Hoax," *EIR*, July 31, 2009, pp. 8-21.

Only block group data, which measure conditions for approximately 1,000 people in small neighborhood areas, versus census or zip code data, reflect the densities of poverty, and associated diseases, that permit competent statistical analysis of the reasons for more intensive health care and higher costs. Here, a poor neighborhood in Baltimore, Maryland.

EIRNS/Stuart Lewis

one medical center that does complex heart surgery and neurosurgery, and determines the average end-of-life spending for each HRR. It finds that some HRRs spend more on their patients during the last two years of life than other HRRs, and labels the higher-spending HRRs as wasteful. It happens that the highest-spending regions are mostly located in the Northeast and Southwest coasts of the United States, and the lowest spenders are generally in the Midwest and Rocky Mountain states. For example, a Dartmouth Atlas analysis of university medical centers found that the highest spending university hospital is New York University Medical Center in New York City. Johns Hopkins in Baltimore is not far behind, as is University of California at Los Angeles (UCLA). The lowest-spending major facilities are Intermountain Health in Salt Lake City, and the Mayo Clinic in Rochester, Minn.

Is it a coincidence that the highest-spending areas contain crowded urban populations with high rates of poverty and minority populations, while the lowest-spending areas have less crowding and far fewer minorities?

But the Dartmouth Atlas claims that the socioeconomic status of patients is not important for its calculations, and references past Dartmouth studies that purport to show that the overspending areas overspend for *all* income categories. Therefore, the Atlas does not use any socioeconomic information in its survey of health-care spending. But what about illness rates and illness severity? The Atlas claims that it adjusts for illness rates and severity, and that the overspending areas are found to overspend, even when adjusted for illness rates and severity.

This report takes a closer look at how the Dartmouth Institute handles information on socioeconomic status and illness severity. In both cases, we will see that the use of these data is fraudulent.

Before going into the grisly details of the Dartmouth statistics fraud on national data, let us review an example of monumental fraud in one targeted area, an area, in fact, targeted by the Atlas and its founder, John Wennberg, as the costliest and most wasteful Medicare region in the country. This area is McAllen, Texas, a town on the border with Mexico. The McAllen story was detailed at the end of Part 1 of this series, and it is a fitting place to begin Part 2. The following is excerpted from Part 1, for the benefit of those who have not had the opportunity to read it. Those who have read it may

want to skip down to the section, "Aggregate Data Hide Poverty," Wennberg's fraudulent use of aggregated socioeconomic data.

The McAllen Fiasco: Lies, Damned Lies, and Statistics

Timed to coincide with Obama's upcoming push for his health-care "reform," the *New Yorker* magazine published a Wennberg-style article on June 1.[2] The article purports to show that in the highest-spending Hospital Referral Region in the Wennberg Atlas, an on-site report by a Harvard surgeon, Dr. Atul Gawande, found that the physicians were massively gaming the system with unnecessary hospitalizations and expensive procedures and tests. In "The Cost Conundrum," Gawande reports on his visit to the town of McAllen, in southern Texas, on the border with Mexico.

He writes, "The explosive trend in American medical costs seems to have occurred here in an especially intense form." Gawande states that the end-of-life medical cost in McAllen is twice the national average. He adds that this high cost is not justified by the rates of disease, the rate of poverty, or the outcomes of the treatment. He compares medical costs in McAllen with another Texas border town, El Paso, and states that the two towns "have essentially the same demographics," and then compares medical costs in McAllen with Grand Junction, Colo., but says nothing about the demographics there. He states that El Paso and Grand Junction have much lower medical expenses than McAllen, but have similar medical outcomes.

Gawande peppers his article with personal conversations with local physicians, including his subjective impressions of their voice inflections and body language, and quotes several of them as acknowledging the obvious, viz., that there exist significant conflicts of interest when physicians own their own hospitals or labs, and that some physicians take advantage of these conflicts of interest.

According to an article in the *New York Times* of June 9, 2009,[3] referring to the above piece in the *New Yorker*, President Obama swallowed the argument hook, line, and sinker.

The *Times* article quoted the Wennberg Atlas, and

This smirking face belongs to Congressional Budget Office director Peter Orszag, the leading spokesman for the murderous Dartmouth Atlas lies that $700 billion can be stripped out of U.S. health-care spending, because it has "no proven outcome."

U.S. Congressional Budget Office

noted, "The Senate Finance Committee recently suggested that one way to pay for health-care overhaul would be to reduce geographic variations by cutting or capping Medicare payments in 'areas where per-beneficiary spending is above a certain threshold, compared with the national average.'" The article pointed out that Wennberg's research "has become phenomenally influential on Capitol Hill since it was popularized by Peter R. Orszag, as director of the Congressional Budget Office and then as President Obama's budget director."

The article stated, "Mr. Orszag says health spending could be reduced by as much as 30%, or $700 billion a year, without compromising the quality of care, if more doctors and hospitals practiced like those in low-cost areas. The supply of hospitals, medical specialists, and high-tech equipment 'appears to generate its own demand,' Mr. Orszag said." The article also noted some opposition. Specifically, Sen. John Kerry (D-Mass.) is quoted as saying, "States like Massachusetts are concentrated centers of medical innovation where cutting-edge treatments are tested and some of the nation's finest doctors are trained.... This may cost a little more, but it benefits the entire country."

The *Times* article ended with references to the work of another group of public health researchers, Drs. Berenson and Hadley, saying that their research "suggests that much of the geographic variation in health spending can be explained by differences in 'individual characteristics, especially patients' underlying health status and a range of socio-economic factors, including income.'"

In a rebuttal to the *New Yorker* article, published in

2. A. Gawande, "The Cost Conundrum," *The New Yorker*, June 1, 2009.

3. R. Pear, "Health Care Spending Disparities Stir a Fight," *New York Times*, June 9, 2009.

TABLE 1

Annualized Payments per Medicare Beneficiary by County of Residence, 2006

County	Medicare Enrollees	Medicare Payments
McAllen, Texas	63,770	$12,384
El Paso, Texas	85,478	$6,163
Grand Junction, Colorado	22,887	$4,436

Source: Daniel Gilden, "McAllen: A Tale of Three Counties," www.thehealthcareblog.com, June 25, 2009.

TABLE 2

Comparative Annualized Payments by County and Need for Premium Assistance, 2006

	Premium Assistance	
County	No (not low income)	Yes (low income)
McAllen, Texas	$10,012	$16,518
El Paso, Texas	$6,709	$9,374
Grand Junction, Colorado	$4,853	$11,425

Source: Daniel Gilden, "McAllen: A Tale of Three Counties," www.thehealthcareblog.com, June 25, 2009.

HealthLeaders Media on June 24, 2009, Cheryl Clark interviewed an internist in McAllen, Dr. James Stewart, who said "I am not normally a conspiracy theorist," but, in researching and writing his article, Gawande "totally brushed off the poverty we live in here." Stewart went on to say that by the time many people get to a health provider, they are diabetic, morbidly obese, have some degree of organ failure, and, in some cases, have their first medical encounter in an emergency room.

The Truth About McAllen

A more detailed critique of the *New Yorker* article was published online at The Health Care Blog on June 29 by Daniel Gilden, entitled "McAllen: A Tale of Three Counties."[4] Gilden states: "The city of McAllen lies at the center of Hidalgo County, one of the costliest areas for Medicare. The population is racially diverse, low income and exhibits high rates of chronic disease. El Paso is similar to McAllen but with less poverty. Grand Junction is the county seat of Mesa County, a largely white and relatively wealthy region."

Gilden shows that the annualized Medicare beneficiary payments are twice as high in McAllen as in El Paso, and three times as high as in Grand Junction (**Table 1**). He next discusses the socio-economic differences between the two populations. "The dissimilarities between the McAllen and Grand Junction county populations are extensive. The socio-demographic characteristics of a population affect its access to care, ability to pay out of pocket for uncovered care and rates of disease associated with diet and life history. The costs of Medicare

4. D. Gilden, "A Tale of Three Counties," The Health Care Blog, June 29, 2009, available online at http://www.thehealthcareblog.com/the_health_care_blog/2009/06/mcallen-is-now-a-tale-of-three-counties.html

co-pays and deductibles can be substantial barriers to access, and history of health care coverage and access to preventative care vary substantially based on socio-economic variables. Low-income individuals often reach Medicare enrollment age with a lifetime history of access and cost barriers, a potent mixture. Barriers to access can lead to expensive hospital care for conditions normally treated on an outpatient basis."

Gilden provides the following data: "Grand Junction Medicare enrollees are 98% white and only 11% require assistance in paying for their Medicare Part B premium (a proxy for low income status). In contrast, McAllen and El Paso are both 26% Hispanic and a higher proportion of Medicare beneficiaries rely on Medicaid to pay for Part B—36% in El Paso and 48% in McAllen." McAllen clearly has a higher poverty rate than El Paso, and Gawande's statement that the two populations "have essentially the same demographics," is not consistent with this poverty data.

Gilden then compares Medicare costs for beneficiaries with and without Part B premium assistance (**Table 2**). "Expenditures are consistently higher for low income beneficiaries, but McAllen is still more expensive than Grand Junction in both income groups—more than 45% more expensive for low-income beneficiaries and more than twice as expensive for those not receiving premium assistance."

This partially explains the difference in costs. Gilden then reviews the population disease rates, as indicated in Medicare hospital and physician billing claims. He finds that the rates of disease prevalence is substantially higher in McAllen than in El Paso for each of the major disease categories, and the rates in El Paso are substantially higher than in Grand Junction (**Table 3**).

For example, per 1,000 population, the rates for dia-

Disease and Prevalence by County, 2006

	McAllen	El Paso	Grand Junction
Single Selected Conditions Rate per 1,000			
Diabetes	422	330	145
Ischemic Heart Disease	443	252	211
Heart Failure	168	107	74
Cerebro-Vascular Disease	202	93	56
Chronic Respiratory Disease	266	190	169
Arthritis	405	290	239
Dementia	107	57	51
Parkinson's	20	15	12
Multiple Conditions Population Percentage			
None of the Selected Conditions	23%	36%	46%
One Condition Only	22%	27%	30%
Multiple Conditions	55%	37%	24%

Source: Daniel Gilden, "McAllen: A Tale of Three Counties," www.thehealthcareblog.com, June 25, 2009.

Medicare Monthly Payments per Patient Without a Diagnosis in the Year for Diabetes or Heart Disease, 2006

County	Medicare Enrollees	Monthly per Person Payments
McAllen, Texas	28,680	$3,147
El Paso, Texas	47,960	$2,564
Grand Junction, Colorado	11,160	$3,307

Source: Daniel Gilden, "McAllen: A Tale of Three Counties," www.thehealthcareblog.com, June 25, 2009.

betes in the three areas are 422, 330, and 145. For ischemic heart disease (not enough blood to the heart muscle, and including heart attack), the numbers are 443, 252, and 211. For cerebro-vascular disease (narrowing of brain arteries, and including stroke) the numbers are 202, 93 and 56. It is also noted that the percentage of patients with more than one of the specified medical conditions is 55% in McAllen, 37% in El Paso, and 24% in Grand Junction.

Gilden then points out that if the patients with diabetes and/or heart disease are not counted, the monthly payments for Medicare are the same for McAllen and Grand Junction (**Table 4**). With more sophisticated techniques of risk assessment based on having multiple conditions as referred to above, the patients with various degrees of risk are remarkably close in their utilization of Medicare services (**Figure 1**), with McAllen at only 10% above Grand Junction, compared with the 300% difference as calculated by Wennberg and quoted in the *New Yorker* article.

In his discussion of the implications of the detailed data, Gilden concludes: "McAllen is different from many areas of the United States: it is sicker and poorer. The observed differences in the rates of chronic disease are highest for those conditions rampant in low income American populations: diabetes and heart disease. Further, Medicare beneficiaries in McAllen have significantly higher rates of co-occurring chronic conditions. As a result the costs of caring for the McAllen Medicare population appears high in comparison to other areas but not abnormally so. McAllen suffers from a tremendous burden, but it is not caused by its physicians: the care they provide leads to costs that are substantially comparable to the other counties in the article once adjustments are made for the magnitude of the health problems they face.

"The disturbing pattern of physician practices uncovered by Dr. Gawande [the conflicts of interests—ed.] sounds a warning not because it foretells a McAllen-like future but because it portrays the ongoing crisis that affects both McAllen and Grand Junction and it is national in scope. Physician culture is only part of the McAllen story. Patients with chronic disease, especially those with multiple conditions, are extremely costly to treat. Cost savings will not be realized by denouncing and penalizing medical systems because they treat patient populations with high rates of disease. Instead health-care reform must develop policies that support streamlining and coordinating care for beneficiaries with multiple conditions, wherever they reside.

"Policies that support lifetime continuity of coverage, disease prevention and early treatment, could reduce health-care costs for populations who now reach Medicare eligibility with a history of under-service. Physician culture has a role to play: Accountable Care Entities are intended to reduce barriers to access by fa-

CY 2006 Annual Medical Payments by Risk Score
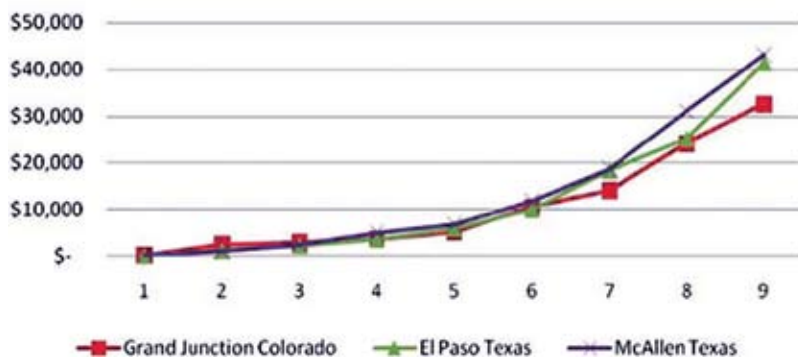
Source: Daniel Gilden, "McAllen: A Tale of Three Counties," www.thehealthcareblog.com, June 25, 2009.

When patients with equivalent risk are compared, the cost of treatment is very similar in the three indicated towns, with the highest-risk patients varying by only 10% in cost of treatment. This is in stark contrast to the Wennberg calculation of 300%, which does not take risk into account.

cilitating care coordination. The high costs of care in places like McAllen will not be dramatically reduced by transforming physician ethics and organization if the roots of the crisis are in the interaction between class, demographics, and chronic disease."

The McAllen story highlights two areas of weakness in the Wennberg Atlas: the analysis of socioeconomic variables, and the analysis of disease severity. Let us examine these two issues in turn.

Aggregate Data Hide Poverty

Individual data, block groups, census tracts, and zip codes: All of these are parameters for statistical measurement of health-care demographics and effects. What you use makes a huge difference. For example, would you buy this story? "There's no poverty in New York City, because the average income is over $50,000 a year." This is precisely the kind of lying which the Wennberg group carries out.

Although the Dartmouth Atlas does not make use of any socioeconomic data in its correlations, the Wennberg group has done studies in the past using socioeconomic data. Before reviewing this past Wennberg research, it is important to get an overview of the types of geographical areas typically used for aggregating health data. Public health research sometimes uses individual data, such as a patient's income, education level, em-

ployment type, or marital status. But frequently researchers use aggregate data such as mean values (averages) or median values (middle values) of variables in populations for comparisons, either due to the aggregate data being more relevant, the individual data not being available, or in order to simplify the statistical calculations involved.

For example, in studying the effectiveness of immunization, it may be helpful to gather aggregate data regarding overall infection rates and vaccination rates from various geographical areas for comparison. In one area there may be an immunization rate of 50%, and frequent large outbreaks of the contagious disease; while in another area the immunization rate is 95%, and outbreaks are rare and small. In this case the aggregate data are helpful for determining what percentage of a population must be vaccinated in order to prevent large outbreaks. In other cases aggregate data may not be helpful, such as the mean weight and mean height of 6-year-old children in estimating the rate of severe malnutrition in a large population; the problem of starving children may be hidden by averaging their weights with normal and overweight children, and in this case individual data would be most helpful.

This example of hiding malnutrition by only looking at the average weight—a method which covers up the extent of a problem—is typical of the kind of fraud rampant in the Wennberg group's use of socioeconomic data. We will see below, that the prior studies by the Wennberg group that failed to find strong correlations between poverty and high Medicare expenses, used aggregate data over geographical areas defined by the zip code of residence, averaging 30,000 people in each such region.

The problems associated with using aggregate data for estimating socioeconomic variables have been studied intensively by the Harvard School of Public Health, particularly in relation to statistics on minorities and health. Harvard has an ongoing research program in this area called "The Public Health Disparities Geocoding Project." In a study of area-based socioeconomic measures, a researcher involved with this project, Nancy Krieger, compared socioeconomic statistics using three different size geographic areas: zip codes

averaging 30,000 people; census tracts averaging 4,000 people; and block groups averaging 1,000 people[5]. This study focused on the statewide populations in Massachusetts and Rhode Island.

The Krieger study points out that census tracts are described by the Census Bureau as "small, relatively permanent statistical division of a county … designed to be relatively homogeneous with respect to population characteristics, economic status, and living conditions." The study states, "The census tract's subdivision, the block group, contains an average of 1,000 persons, and is the smallest geographical census unit for which census socioeconomic data are tabulated." The study also quotes the Census Bureau in describing zip code areas as follows: "Zip codes, in turn, have an average population of 30,000 and are 'administrative units established by the United States Postal Service … for the most efficient delivery of mail, and therefore generally do not respect political or census statistical area boundaries', and they can range in size from large areas cutting across states to a single building or company with a large volume of mail."

Think for a moment of who lives in your own zip code, and the income variation within that area. If you live or work in an urban setting, your zip code likely includes people with a wide variety of incomes as well as a wide variety in other socioeconomic variables, such as marital status and education. How much sense would it make to assign each of the residents in your zip code the median income in the zip code, for the purpose of a public health study?

The socioeconomic indicators in this Harvard study included occupational class, income, poverty, wealth, education, and crowding. The health data included deaths from all causes and cause-specific, cancer incidence by type and location, low birth weight, childhood lead poisoning, sexually transmitted infections, tuberculosis, and non-fatal weapons injuries. The effect of size of geographical unit is clearly documented in Table 2 of this publication.

For example, in Massachusetts, the percentage of white people living in geographical areas, that have 20-100% of the population below the poverty level, varies

5. N. Krieger et al., "Race/Ethnicity, Gender, and Monitoring Socioeconomic Gradients in Health: A Comparison of Area-Based Socioeconomic Measures—The Public Health Disparities Geocoding Project," *American Journal of Public Health*, 2003, vol. 93, no. 10; pp. 1655-71.

significantly according to the size of the geographical area used. Using block groups, 8.4% of the white population lives in block groups with 20-100% of the population below the poverty level. Using census tracts, 7.7% live in census tracts with 20-100% of the population below the poverty level. And using zip codes, 5.8% of the population lives in zip codes with 20-100% of the population below the poverty level. Thus, going from block groups to zip codes decreases the number of people in high-end poverty areas from 8.4% to 5.8%, a decrease of apparent poverty by one third. The sizable decrease in apparent poverty in going from block groups to census tracts suggests that going to still smaller geographical units would expose even more poverty.

Overall, this part of the study shows that zip codes compared to block groups hide approximately one third to one-half of poverty, and indicates that even more poverty may be seen if yet smaller geographical areas were used for aggregating data.

The corresponding poverty numbers for African Americans, who make up only 4.9% of the entire population, were 48.3%, 50.4%, and 46.2%, showing little variation among block groups, census date, and zip codes, but much higher numbers overall compared to whites, and an apparent decrease in poverty by 4%.

The numbers for Hispanics went in similar directions. For poverty, the numbers for block groups, census tracts, and zip codes were 53%, 54%, and 40%, respectively, an apparent decrease by one quarter; and for low education the numbers were 42.5%, 35.1% and 22.6%, an apparent decrease by nearly half.

Poverty Leads to Premature Death

A second part of the Krieger study investigated the relation of socioeconomic status to health, using only the census tract level of aggregates. For premature mortality, defined as death before age 65, the numbers were given per 100,000 population, and were as follows: Comparing census tracts with 0-49% working class, to census tracts with 75-100% working class, the white death rates went from 187.7 to 402.1, more than doubling. Corresponding numbers for blacks were 475.3 to 573.2, an increase of 20%; and for Hispanics 196.7 to 329.6, an increase of 67%. Comparing census tracts with median income of over $47,125 to census tracts with medium income of $4,999-$26,471, the premature mortality numbers for whites rose from 186.9 to 446.0, an increase of 138%; for blacks the numbers went from

262.6 to 648.9, an increase of 147%; and for Hispanics from 112.5 to 333.6, an increase of 199%.

Comparing census tracts by a crowding measure, for census tracts with 0-4.9% of the population living in crowded conditions to census tracts with 20-100% of the population living in crowded conditions, the mortality numbers for whites went from 258.2 to 911.8, an increase of 253%; for blacks from 410.6 to 539.6, an increase of 31%; and for Hispanics from 219.5 to 294.9, an increase of 34%. A similar trend towards greater premature deaths was seen using the percentage of population with low education.

Overall, this part of the study demonstrates that premature death varies dramatically with socioeconomic variables, with increased death rates related to degree of poverty, low education, and crowding. Most important, by extension from the first part of the study, the relationship of these socioeconomic measures to premature death is significantly hidden when using aggregate data for progressively larger geographical areas.

It is clear from this study that the zip code geographical area is generally too large to accurately reflect socioeconomic status, generally hiding one third to one-half of the poverty compared to block groups, and likely hiding even more when compared to the best data, which would be individual information. Particularly in an urban environment, neighborhoods with low income, low education, and crowded housing are averaged with adjoining middle class or wealthy neighborhoods, and the aggregate measure is somewhere in the middle. Similarly, measures of disability and family structure are all smoothed out. This smoothing hides important differences in the need for medical care.

How To Eliminate Poverty, Wennberg-Style

The Dartmouth Atlas itself does not utilize socioeconomic data such as income, marital status, education, or degree of population density (urban versus rural). For example, when discussing the differences between high-spending and low-spending regions, the Atlas states (page 4), "The most surprising and significant difference between regions is that mortality is higher in high-spending regions." The Atlas then speculates on various reasons for this higher mortality, such as hospital-acquired infections, but does not mention socioeconomic factors.

How does the Atlas justify ignoring socioeconomic

creative commons/Joe Shlabotnik

A Dartmouth Atlas analysis of university medical centers found that the highest-spending university hospital, per capita, is New York University Medical Center in New York City, shown here. Given the concentration of poor people in New York City, should that be any surprise?

variables? There is no discussion of this issue in the Atlas, but a scan of its footnotes referencing prior publications provides something of an answer. The reader is encouraged to pursue the following detailed discussion, as if trying to solve a murder mystery. It is necessary to poke through several levels of obfuscation, until the whole picture suddenly jumps out.

We can begin with page 9 of the Atlas, which contains the following statement, regarding severity of illness: "The Dartmouth Atlas Project has conducted considerable research that shows only a weak relationship between how sick patients are and the amount and intensity of care they receive"; this statement is followed by a footnote referencing an earlier study from 2003 by

Elliot Fisher, who is the Principal Investigator for the Dartmouth Atlas Project. This Fisher 2003 study is entitled "The Implications of Regional Variations in Medicare Spending. Part 1: The Content, Quality and Accessibility of Care."[6]

The Fisher 2003 study involved patients admitted to the hospital with only three diagnoses: hip fracture, heart attack, and colorectal cancer treated with surgery. The authors state that they chose these three diagnoses because, with these conditions, nearly everyone is admitted, regardless of the hospital or area of the country, and so the study could focus on measuring the intensity of resources used after admission, such as length of stay and number of specialist consultations.

The Fisher 2003 study used individual patient data for diagnosis, age, gender, and race, all available from Medicare statistics kept by the Federal government. Unlike the Atlas, this study also included socioeconomic data such as income, but the data used for each patient were not the individual socioeconomic data, but the (highly unreliable—see above) aggregated data for the zip code of residence.

The study used the 306 Hospital Referral Region geographic divisions of the United States, arranged the regions by end-of-life cost, and then divided the set of regions into five groups (going from lowest to highest end-of-life cost), so that the population of each quintile was approximately the same. Each of the quintiles was then divided according to age group (65-74, 75-84, and 85 and over), gender, and race (black and all other). Note that, as in the Atlas, the highest-spending regions are on the Northeast and Southwest coasts, corresponding to areas that include high numbers of impoverished urban areas, and the lowest-spending regions are in the Midwest and Rocky Mountain areas, corresponding to mostly white working-class and middle-class populations.

Regarding the comparisons of high-spending areas to low-spending areas, Fisher reported that utilization in the higher-spending HRRs was increased in all of the three income groups defined by amount of Social Security income, and in blacks as well as whites within these income groups. However, because the income data are

aggregated by zip code, this finding is suspect. In addition, there is the ecological effect that is described in several of the references discussed in the article. For example, it is likely that the small number of blacks living in the Mayo Clinic HRR are not subject to the community effect of the intense concentration of poverty, characteristic of the large East Coast urban centers, and this effect could lower their utilization rate even if they had comparable individual socioeconomic measures.

Using this aggregated income data, the Fisher 2003 study found that end-of-life spending was somewhat higher for low-income patients, and was also somewhat higher for high-income patients, but the extent of the variation was not large enough to explain a significant amount of the difference in regional spending. This publication states in its concluding section, "The greater-than-twofold differences observed across U.S. regions are not due to differences in average levels of illness or socioeconomic status."

Examining the data in more detail, Table 1 of the study pertains to admissions for hip fracture. In reading across the five quintiles arranged by Medicare cost, there is little variation in percentage by age, or in proportion by gender. However, there is an impressive variation by race. For hip fracture admissions, the percentage of black patients in the lowest-spending quintile is 1.1, while the percentage of blacks in the highest-spending quintile is 4.8, an increase by more than fourfold. The percentage of blacks in the second, third, and fourth quintiles is 3.1, 4.0, and 5.2. Thus, the upper spending quintiles have a disproportionately increased percentage of black patients.

Since, in the U.S., blacks have, on average, a lower socioeconomic status, this result seems to indicate that there is a strong relation between race, socioeconomic status, and end-of-life spending. Note again, that the race data are not smoothed, but is specific for each patient in the Medicare database.

Regarding income level using the zip code aggregated income, the same table shows that the percentage of patients with low income, as indicated by Social Security income less than $1,700/month, varies from 18.8 to 21.3, going from the lowest to highest quintile, a much less dramatic difference compared to black race. And the percentage of high-income patients, as indicated by a Social Security income of greater than $2,600/month, varies from 24.3 to 39.2, somewhat

6. E.S. Fisher et al., "The Implications of Regional Variation in Medicare Spending. Part 1: The Content, Quality, and Accessibility of Care," *Annals of Internal Medicine,* 2003, vol. 138, Issue 4; pp. 273-87.

The Mayo Clinic in Rochester, Minn., is reputedly the most efficient hospital center in the United States, in terms of cost per patient, as argued by the Dartmouth Atlas. Have they considered that Rochester is about as far away from major centers of urban poor as you can get?

larger than the variation for low income, but nowhere near the more than 400% difference for race. Thus, while there is some shifting of the income status related to health-care spending, it is small, compared to the fourfold change in black representation.

The tables for colorectal cancer surgery and heart attacks show similar variation by race. The colorectal cancer surgery quintile percentages for blacks go from 2.1 for the lowest-spending quintile, up to 9.7 for the highest-spending quintile, again more than a fourfold increase. For heart attacks, the quintile percentages for blacks go from 1.9 for the lowest-spending quintile, up to 7.1, a nearly fourfold increase. The relationship to aggregated zip code income is comparable to the data for hip fracture.

The Next Level Down in the Inferno

The 2003 study does not discuss the validity of the use of aggregated data from the zip code of residence, but references, in a footnote, the use of such socioeconomic data to an earlier study done in 2000, also by Fisher. This prior study is entitled "Associations Among Hospital Capacity, Utilization, and Mortality of U.S. Medicare Beneficiaries, Controlling for Sociodemo-

graphic Factors."[7] This Fisher 2000 study discusses the merits of the methodology of income statistics more specifically. Here again, the income data used for each patient in this Medicare cost study is not the income of the individual patient, but the aggregate measure of the income of all the people within the zip code of residence of the patient, as provided by the 1990 census. Other socioeconomic data used in the study were also aggregate values for the entire zip code, including education, marital status, employment status, and measures of disability including self-care limitation, mobility, and work disability. The individual-level data that were used included age, gender, and race.

In discussing the issue of zip code data, Fisher uses the term "ecologic" as equivalent to "aggregate." The Fisher 2000 article states, "Although we used ecologic measures of education, income, poverty status, and disability, such ecologic measures have been shown to provide valid estimates of individual attributes in studies based on census-tract level data, and reasonable proxies in studies based on zip code level data." There are four references footnoted in this quote. The phrase "valid estimates of individual attributes in studies based on census-tract level data" references two studies that purportedly support the contention.

These two studies, however, only raise more questions about the use of census tract data. One of the references is to a paper by Krieger from 1992, which used data from a Kaiser Permanente HMO population in northern California.[8] This Krieger 1992 study states that it "compared the association of both individual-

7. E.S. Fisher et al., "Associations Among Hospital Capacity, Utilization, and Mortality of US Medicare Beneficiaries, Controlling for Sociodemographic Factors," *Health Services Research*, 2000, vol. 34; pp. 1351-62.

8. N. Krieger et al., "Overcoming the Absence of Socioeconomic Data in Medical Records: Validation and Application of Census-Based Methodology," *American Journal of Public Health,* 1992, vol. 82, no. 5; pp. 703-09.

level and census-based socioeconomic measures with four health characteristics that are known to vary by race and socioeconomic position: hypertension, height, cigarette smoking, and number of full-term pregnancies." The socioeconomic variables used included race, occupation, and education. The results of this particular study showed, "Individual, tract and block-group measures of social class and education provided highly comparable estimates of association with four diverse health characteristics known to exhibit marked social class and race/ethnic gradients: hypertension, height, smoking, and number of full-term pregnancies."

However, this study also points out that in a related study done in Alameda County, Calif., "Census block-group measures of social class and poverty closely approximated individual-level measures as correlates of women's reproductive histories, whereas comparable data from the tract level performed less well. Contextual analyses likewise indicated the importance of categorizing women by both individual-level and block-group-level socioeconomic characteristics." The study goes on to state: "The importance of validating this census-based approach to measuring socioeconomic position is underscored by the numerous US studies that, in the absence of individual-level social class data, have used census-derived data from people's immediate neighborhoods in conjunction with individual-level health data to describe, analyze, or control for social gradients in various health outcomes. These include investigations regarding race/ethnic differences in cancer incidence and survival, homicide, and childhood diseases, as well as studies examining intraurban variation in mortality. All have observed significant associations between people's health status and the socioeconomic conditions of the neighborhoods in which they live, and all have expressed concerns regarding the use of census-derived data. The results of this study and comparable research indicate that these prior findings most likely are legitimate and probably underestimate the effect that would have been observed were individual-level social class data available."

Thus, this publication documents, particularly in its overall review of the literature, that while census-tract-level parameters may demonstrate an effect, the effect is probably underestimated when compared to individual-level data. The author of this paper, Nancy Krieger, is the same Krieger referenced above for her 2003 paper

that showed significant decreases in apparent poverty when viewed in larger sizes of aggregates.

The Second Reference Contradicts the First

The second study referenced in the above Fisher 2000 quote is to a publication by Arline T. Geronimus et al., entitled "On the Validity of Using Census Geocode Characteristics to Proxy Individual Socioeconomic Characteristics."[9] This study used data from the Panel Study on Income Dynamics, and the National Maternal and Infant Health Survey. Both of these databases contain individual data on age, race, income, and education, and also contain aggregate data on income and education, and the aggregate data are both on the census tract level and the zip code level. The study found that: "Results based on census tract characteristics for respondents are similar to results based on zip code of residence. We report results only for zip code areas."

The study concludes, "Our findings are inconsistent with the conclusion that Krieger (1992) drew from her analysis of a select health maintenance organization (HMO) sample in Northern California—that aggregate census-based proxies are good substitutes for micro-level measures of individual socio-economic characteristics [micro-level refers to measures by individual, such as individual income—ed.]. By obtaining similar point estimates of the relative risks of health outcomes by socioeconomic group, using both aggregate census-based measures and the crude individual-level measures available in her data, Krieger demonstrated the relative usefulness of the aggregate census-based approach in her study sample. But our statistical framework and empirical findings lead us to question whether such findings imply the general validity of using aggregate census-based measures to proxy for individual characteristics. Because Krieger's empirical work was not interpreted in light of a statistical framework, the nature and source of biases could not be discussed. Now that we are able to place her results in the context of such a framework, we would argue that finding consistent results between micro and aggregate variables is the exception, not the rule."

9. A. Geronimus et al., "On the Validity of Using Census Geocode Characteristics to Proxy Individual Socioeconomic Characteristics," *Journal of the American Statistical Association*, 1996, vol. 91, no. 434; pp. 529-37.
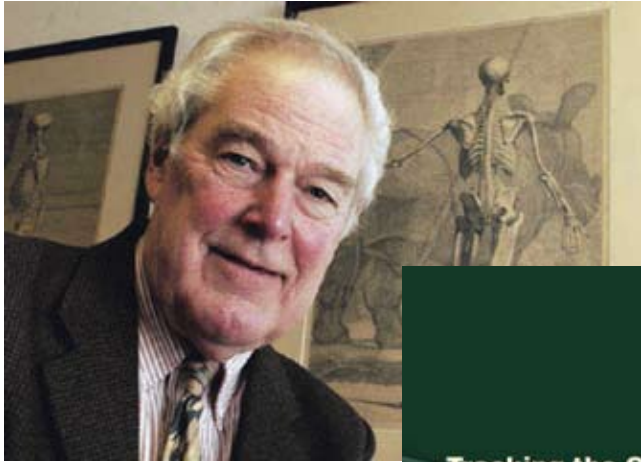
Dr. John Wennberg's (inset) Dartmouth Atlas: It's conclusions and recommendations form the basis for the Obama/Orszag Nazi health-care plan to slash 30% from Medicare and other heatlh-care programs.

The study concludes: "The most conservative lesson that we have drawn from these results is that investigators are ill-advised to interpret results of regressions based on aggregate variables as if they were based on micro-level variables. But the framework that we have presented can be used to guide thinking about the likely direction of bias in such estimates. In situations where important variation exists in the relevant independent variables within aggregate units, the use of aggregate proxies will tend to yield underestimates of the effect of the micro variable, while inadequately controlling for confounding effects. But in cases where the aggregate variable might represent a broader construct than the micro-level construct, estimates based on the aggregate data are likely to exaggerate the effect of the micro-level counterpart on outcomes of interest. Since Robinson's classic paper on the 'ecological fallacy', researchers have been wary of interpreting estimates based on aggregate data. The results reported here suggest that this should be a concern not only in the case where the unit of concern is an aggregate unit, but also in the case where the unit of analysis is a micro unit and aggregate variables are used to proxy micro-level constructs."

The issue of a broader level construct than the micro-level construct refers to the effect of others in the community on the index case: for example, being surrounded by poverty has an effect itself, in addition to one's own income status. This could be due to a broad range of factors, such as the presence of contagious disease, or peer pressure to drop out of school or use illegal substances. This consideration serves to point out the complexity of the problems involved in using aggregate proxies.

Studies Contradict Wennberg Conclusion

Let us review now some implications of the Krieger and Geronimus papers. First, the Geronimus study concludes from its own empirical data, and from its statistical framework, that the finding of Krieger of "highly comparable estimates" between individual, block group aggregates, and census tract aggregates, is the exception, not the rule. Second, Krieger points out, "while census tract level parameters may demonstrate an effect, the effect is probably underestimated when compared to individual level data." That is to say, in reviewing the two references given by the Fisher 2000 article to document his assertion that "ecologic measures have been shown to provide valid estimates of individual attributes in studies based on census-tract level data," one of the two references says that the aggregate data are probably an underestimate, and the other reference says that the findings of the first reference is the exception, not the rule. Thus, both references given by Fisher 2000 undercut his point, rather than support it.

These observations regarding these two references are particularly relevant, given the way Wennberg ultimately uses these findings. Wennberg does not utilize socioeconomic variables in the Atlas, and justifies this by claiming that they are not strongly enough cor-

related with Medicare expenses to explain the great majority of the expense variations. Thus, it is the lack of strength of effect that Wennberg uses for his argument that socioeconomic variables do not have to be taken into consideration in the Atlas. And in the Krieger 1992 paper, she says that the effect of using aggregates is to *underestimate* the effects of socioeconomic variables.

More Fraud from Zip Code Data

Now let us examine the two references given by Fisher 2000 for the second part of the quoted passage, that ecologic measures have been shown to provide "reasonable proxies in studies based on zip code level data." The term "reasonable proxies" is in contrast to the term "valid estimates," earlier in the sentence. Again, there are two references. The first is to a study by M.E. Gornick et al., titled, "Effects of Race and Income on Mortality and Use of Services Among Medicare Beneficiaries."[10] This study examined the relation of income and race to rates of utilization of Medicare services, such as hospitalization rates and physician visit rates; and the relation of income and race to mortality and other health indicators. The study used income data derived from census aggregates based on zip codes, and also compared these results with individual income data derived from a survey of 9,000 Medicare beneficiaries.

The direction of the findings was what would be expected: Using individual Medicare data for 1993, the year under consideration, the age-adjusted death rate for black men was 8.0 per 100, and for white men 6.7 per 100, a black-to-white ratio of 1.19. The corresponding rates for black versus white women were 5.2 and 4.5, a ratio of 1.16. In comparing the use of outpatient physician visits, blacks averaged 7.2 visits for the year 1993, whites 8.1, or 12.5% higher. Regarding hospitalizations, the racial difference was opposite to that of outpatient visits: Blacks averaged 376 hospital discharges per 1,000 Medicare beneficiaries, while whites averaged 329, a difference of 14%.

Annual income was grouped in four categories, less than $13,100; $13,101-16,300; $16,301-20,500; and over $20,500. Using the aggregate data by zip code, among the least affluent whites, there were 369.6 discharges per 1,000 enrollees; among the most affluent there were 296.9 discharges, a difference of 24%. In contrast, using the individual income information derived from the Beneficiary Survey, and grouping people using the same income parameters, the hospitalization rate for the least affluent group of white enrollees was 55% higher than the most affluent group of white enrollees. That is, the percentage difference in hospitalization rates of lowest versus highest income categories more than doubled, when using individual income data versus zip code aggregate data!

Similarly, using zip code income data, the rate of mammography for low-income whites compared to high-income whites was 33% lower, while, using individual income from the Beneficiary Survey, the rate difference was 53% lower. Referring to the above two examples, the study states, "These effects of income in the Medicare Current Beneficiary Survey were in the same direction as those in the Zip Code analyses but were more pronounced, indicating that the effect of income on rates of hospitalization and mammography among white beneficiaries may be underestimated in analyses according to Zip Code median income. The one exception was for visits to physicians for ambulatory care; for that variable, the Medicare Current Beneficiary Survey showed no effect of income, whereas the analysis according to Zip Code income showed a moderate effect."

The author goes on to state, "For the black beneficiaries, the income-related pattern in the Medicare Current Beneficiary Survey was more variable than they were for the white beneficiaries, as we found in the analyses according to Zip Code income. However, among the least affluent black women the mammography rage was 39% lower than it was among the most affluent black women, which was again a more pronounced difference than was found in the analyses according to Zip Code income."

The second reference given by Fisher 2000 for the second part of the quoted assertion, is a study by T.P. Hofer et al., entitled "Use of Community Versus Individual Socioeconomic Data in Predicting Variation of Hospital Use."[11] This study compared individual pa-

10. M.E. Gornick et al., "Effects of Race and Income on Mortality and Use of Services Among Medicare Beneficiaries," *The New England Journal of Medicine*, 1996, vol. 335, no. 11; pp. 791-99.

11. T.P. Hofer et al., "Use of Community Versus Individual Socioeconomic Data in Predicting Variation of Hospital Use," *Health Services Research*, 1998, vol. 33, no. 2, Part 1; pp. 243-59.

tient socioeconomic data derived from the National Health Interview Survey, and aggregate zip code socioeconomic data from the 1990 Census. An additional aggregate data source for employment was also used, the 1989 Area Resource File. The purpose of the study was to compare the association of socioeconomic variables with hospitalization rates, using the two types of socioeconomic data, in order to determine the validity of using the aggregate data as a proxy for individual data. The socioeconomic variables included income above or below the poverty line, employment versus unemployment, education as measured by whether the person graduated high school, and rural versus urban home setting. Age and gender were also included.

The results of the study were that the direction of the association of each variable on hospitalization rate was the same for both types of data, and the statistical significance of the relationship was also the same. There was no report on the quantification of effect, so a more detailed comparison of the use of the two types of data, individual versus census tract aggregate, could not be assessed from the publication.

Let us review now the implications of the cited Gornick and Hofer studies. Gornick studied the associations between socioeconomic variables, such as income and race, and utilization of medical care, such as hospitalizations and mammograms, and showed that there is, overall, a substantially stronger association using individual data compared to using zip code aggregate data. He points out that there are exceptions, and also discusses the confounding tendency for a group effect of socioeconomic variables on the individual, termed the ecological effect. Hofer demonstrates associations among a variety of socioeconomic variables and hospitalization rates, and shows that the same associations exist when zip code aggregate data are used compared to individual data, but he does not provide data quantifying the comparison, and only says that the statistical association is equally strong.

In statistics, the term "equally strong" is generally related to likelihood of association, but this may not be of the same degree of quantification of comparison as is discussed, for example, in the Gornick study, in which a percentage of effect on utilization rate is associated with the variable. Although Hofer actually uses the phrase "reasonable proxy" when comparing individual data with aggregate data, the question is, proxy for

what? If the purpose of the study is to confirm the existence of a significant association between a socioeconomic variable and the utilization of a health-care item such as hospitalization, then aggregate data may be a reasonable proxy. But if the purpose of the study is to quantitatively evaluate the effect of a socioeconomic variable on health-care expenditures, for the purpose of quantitatively comparing various regions of the country, as is done in great detail in the Wennberg Atlas, then this study does not appear to demonstrate that aggregate data are a "reasonable proxy."

I would expect that if more robust numbers were available, they would have been presented in the Hofer paper. Thus, the two references for the second part of the Fisher 2000 assertion, that aggregate zip code socioeconomic data are a reasonable proxy for individual data, do not, in fact, support the assertion.

Thus, the Wennberg Atlas references studies that purport to justify not including socioeconomic variables in the comparison of HRR utilization rates. And these studies then refer back to the above four references footnoted in the Fisher 2000 paper; but these references do not actually support what Fisher and Wennberg contend; they do not support ignoring socioeconomic variables. They document, in fact, the weakness of using geographical area aggregate data regarding socioeconomic variables, particularly of the size of zip code aggregates.

Diagnosis vs. Disability: The Issue Is Frailty

Now let us look at an issue closely related to socioeconomic variables: the issue of severity of illness. Wennberg claims, in the introduction to his Dartmouth Atlas 2008, that he has studied the relationship of severity of illness to the cost of treatment, and found very little correlation. He states, "The most obvious place to look for the source of variation in care is how sick people are in different parts of the country. Indeed, most policy makers, physicians, and patients assume that differences across regions in the prevalence of disease among the chronically ill are the most important factor driving the variation in medical spending. Patients who are sicker naturally need more care, goes the thinking, and consequently Medicare spends more in regions where disease is more common. But while

there is some variation in the prevalence of disease in different parts of the country, it turns out that differences in the level of illness account for only a small fraction of the variation in the amount of medical care delivered."[12]

To support this point, the Dartmouth Atlas gives the following reference. "One study, for example, looked at cohorts of patients with three different illnesses: solid tumors, congestive heart failure (CHF), and chronic obstructive pulmonary disease (COPD). The study matched patients within cohorts for age, sex, race, and severity of illness and then compared the care they received at 77 well-respected academic medical centers. Even among matched patients, there was wide variation in the amount of care delivered. At one academic medical center, for example, patients with COPD spent 13.1 days in the intensive care unit during the last six months of life, while, at another, COPD patients spent only 1.8 days in the ICU. Patients with CHF saw a physician 99.3 times in the last six months of life at the highest ranked hospital and 15.2 times at the lowest ranked. Yet all of these hospitals were caring for extremely ill patients."[13]

The above quote references a study done by Wennberg in 2004, which comes to the above conclusions.[14]

The Wennberg 2004 study, in turn, makes reference to an earlier study to justify its statement that the patients were matched for severity of illness. This earlier study is by Lisa Iezzoni, "Chronic Conditions and Risk of In-Hospital Death."[15] This study examined the relationship of discharge diagnoses of patients who died in hospitals, to death rates in hospitalized patients, to determine the relative risk of death among the diagnoses,

U.S. Geological Survey

Living conditions along the U.S.-Mexican border, where McAllen, Texas is located, provide the perfect circumstances for proliferation of an extremely sick population, with multitudes of chronic and acute diseases. Despite exposure of this fact by researcher Daniel Gilden, the Dartmouth Atlas chooses to target doctors in this area for "overspending" on health care.

and focused on the effect of underlying chronic conditions, as well as the acute diagnosis associated with the admission. The chronic conditions used were the 13 following diagnosis groups: cancers with poor prognosis, metastatic cancer, AIDS, chronic pulmonary disease, coronary artery disease, congestive heart failure, peripheral vascular disease, severe chronic liver disease, diabetes with end organ damage, chronic renal failure, nutritional deficiencies, dementia, and functional impairment (such as paralysis, wheelchair dependence, or tracheotomy).

The primary causes of death were grouped into four categories by likelihood of mortality: rare, low mortality, moderate mortality, and high mortality. Rare mortality includes conditions such as bronchitis and angina; low mortality includes seizure and urinary tract infection; moderate mortality includes acute myocardial infarction (heart attack) and stroke; high mortality includes traumatic coma over one hour, and lung cancer. The study computed the effects of each chronic condition on the likelihood of death for patients within each mortality category by admission diagnosis, and showed that some chronic conditions, such as AIDS, metastatic cancer, congestive heart failure, severe chronic liver disease, and nutritional defi-

12. J. Wennberg et al., "Tracking the Care of Patients with Severe Chronic Illness, *The Dartmouth Atlas of Health Care 2008,* Dartmouth Institute for Health Policy and Clinical Practice, 2008, p. 3.

13. *Ibid* p. 9.

14. J. Wennberg et al., "Use of Medicare Claims Data to Monitor Provider-Specific Performance Among Patients with Severe Chronic Illness," Health Affairs web exclusive, Oct. 7, 2004.

15. L. Iezzoni et al., "Chronic Conditions and Risk of In-Hospital Death," 1994, *Health Services Research,* vol. 24, no. 4; pp. 435-60.

ciencies, have the greatest effect in increasing death rates across all of the mortality groups.

Although these correlations identify the odds of dying, are they predictive of end-of-life costs? The answer appears to be no. This is the key question. For example, a severe head injury with prolonged coma may be strongly associated with death, but because the death may occur quickly, the total end-of-life costs may be relatively low. Likewise, lung cancer has a high mortality measured in months, not years, and so the accumulation of health expenditures may be lower than those for a more slowly growing tumor. This is the lesson from McAllen.

Measuring Frailty

Poor people are frailer. A recent overview of the literature in this field was presented by S.L. Szanton, in a study entitled "Socioeconomic Status is Associated with Frailty: The Women's Health and Aging Studies," just published on Aug. 19, 2009.[16] In the introduction to this study, Szanton writes: "The association between socioeconomic status (SES) and poor health has been well documented. A potentially important risk factor for many poor health outcomes among older adults is geriatric frailty. Defined as a state of increased vulnerability, geriatric frailty is associated with a higher risk of hospitalizations, nursing home placement, and death. Little research has investigated the relationship between low SES and frailty.

"Frailty is a clinically identifiable, prevalent, geriatric syndrome that [co-author Linda P.] Fried defines as a combination of weakness, exhaustion, lack of activity, weight loss/underweight and slow walking speed. There is considerable clinical, biological, epidemiological, and genetic research interest in the origins of this prevalent syndrome of frailty.

"While the genetic and biologic research into frailty is burgeoning, there has been a dearth of research on the possible etiologic relationship between sociologic factors and frailty. This is particularly important as the population of older adults with low education is increasing faster than those older adults who are more educated. Developing a better understanding of the sociologic factors is particularly relevant now as health disparities research has advanced to investigate the ways in which low SES 'gets under the skin' and plays a role in health disparities."

Szanton describes her own study as follows. "We conducted a cross-sectional analysis of the Women's Health and Aging Studies using multivariable ordinal logistic regression modeling the estimate the relationship between SES measures with frailty status in 727 older women. Control variables included race, age, smoking status, and co-morbidities.

"Ten percent of the sample were frail, 46 percent were intermediately frail, and 44 percent were robust. In adjusted models, older women with less than a high school degree had a threefold greater odds of frailty compared to their more educated counterparts. Those with less than $10,000 yearly income had two times greater odds of frailty than their wealthier counterparts. These findings are independent of age, race, health insurance status, co-morbidity, and smoking status. African-Americans were more likely to be frail than Caucasians. However, after adjusting for education, race was not associated with frailty. The effect of race was confounded by socioeconomic position."

Let us now return to the case of McAllen, Texas, which was reviewed above, and look more closely at how Daniel Gilden used the concept of frailty in constructing his rebuttal of Wennberg's Atlas. Gilden is the head of JEN Associates, Inc., a health-care consulting firm in Cambridge, Mass. JEN has developed methods to anticipate health-care needs for patients over the medium term, such as nine months, based on an analysis of the functional effects of medical conditions. This measure is termed the JEN Frailty Index (JFI).[17] These estimations are used by JEN clients for planning programs and expenditures. JEN clients have included the Federal Department of Health and Human Services Centers for Medicare and Medicaid Services, the Department of Veteran Affairs, and the states of Massachusetts, Minnesota, California, Ohio, and Wisconsin.

These are not academic exercises; enormous financial resources are allocated based on the documented predictive value of the JEN estimations. These estimations are made on living patients, and the health re-

16. S.L. Szanton, "Socioeconomic Status is Associated with Frailty: The Women's Health and Aging Studies," *Journal of Epidemiology and Community Health,* published online, Aug. 19, 2009.

17. The JEN Frailty Index (JFI) was developed under funding by the Robert Wood Johnson Foundation's Medicare/Medicaid Integration Project, at the University of Maryland Center on Aging.

sources anticipated to be needed are to be spent during the ongoing lives of the patients.

The JEN Frailty Index is described by JEN as follows: "The initial work was done in support of predictive models for adverse clinical outcomes in elderly Medicare populations. The system emulates an activities-of-daily-living model of health and uses diagnoses that are: 1) statistically correlated with a future need for acute/post-acute care; and 2) have an impact on patient functioning. We have used the index for state, federal and privately funded analyses and it is a key modeling covariate in our evaluation work. The design of the index is outcome focused—not payment focused. The index only selects diagnoses based on empirical demonstrations of a high statistical correlation with future outcomes. A high score is achievable only through the reporting of morbidity that affects a number of different body systems.

"The score is based on 13 impairment categories of disease/signs found to be significantly related with a concurrent and future need for long term care services. The categories include: minor ambulatory limitations, severe ambulatory limitations, cognitive developmental disability, chronic mental illness, dementia, sensory disorders, self-care impairment, syncope, cancer, chronic medical disease, pneumonia, renal disorders and other systemic disorders (e.g. septicemia). For each category a score of 1 is assigned if a diagnosis associated with the condition is found on at least one Medicare claim during a specific calendar year of study. No frequency threshold, claim type, provider type or service type selection logic is used. The frailty individual impairment category scores are summed to produce an aggregate frailty risk score. The frailty risk score has been demonstrated to have a linear relationship with the probability of future acute care, post-acute care and death and is strongly predictive."

Wennberg's Lies Totally Exposed

The JEN definition of frailty is more sophisticated that that of Szanton, in that JEN includes more factors that are needed to reliably predict future health care needs.

Gilden used his JEN Frailty Index analysis as summarized above, and found that when patients with equivalent levels of frailty are compared, the cost of end-of-life care is *nearly identical,* in all three towns, for all risk levels except the highest; at the highest end,

the cost is greater in McAllen by only 10% compared to Grand Junction. This is in contrast to the Wennberg statistics, which indicate a cost difference of 300%. What is most remarkable about the Gilden analysis is that it was done with publicly available data from Medicare. Gilden's work with the JFI is well known in the field. Apparently, Wennberg chose not to utilize what was available.

And how did the Wennberg group respond to the Gilden study? Jonathan Skinner, a long-time collaborator of Wennberg, added comments to the Gilden blog, saying that the McAllen doctors were making up diagnoses; they were lying. Gilden, anticipating this line of criticism, also added a comment to the blog, noting that a made-up diagnosis would not result in the same total amount of billing care as a true diagnosis, but the statistics in McAllen do not show any such variance.

I would add that the doctors would have had to anticipate the kinds of risk categories used by Gilden, so that the billings for each risk level would match, an extremely unlikely occurrence. Furthermore, the El Paso doctors would also have to be lying, less than the McAllen doctors, but again, just the right amount for each risk level, because their billings also fall on nearly the exact same curve as the Grand Junction billings, as seen in the Gilden graphs.

Gilden demonstrates that it is possible to produce accurate and meaningful estimations of the medical needs of a population, in the above case, based on publicly available data. The Wennberg Atlas and associated publications consistently ignore and trivialize important regional differences in socioeconomic variables and associated health-care needs, and use a measure of disease severity that is incapable of predicting true health-care needs.

Wennberg-style headlines claim that one third of Medicare expenses could be saved if the "least efficient" geographical areas were forced to conform to the practices of the "most efficient." To enforce this policy, President Obama is currently insisting that any consensus health plan must include an IMAC board that will make the necessary decisions to reduce the Medicare budget consistent with the Wennberg Atlas recommendations. If Obama is to be taken at his word, this will mean major cuts in necessary medical services for the poor, the elderly, and the frailest among us. And Heaven help those who fall into more than one of these three categories.