

**Disparities in Health Care: Methods for Studying the Effects of Race, Ethnicity, and SES
on Access, Use, and Quality of health care.**

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Foreword

Readers of this paper may be researchers who study the use of health care rather than social scientists who study population health. This paper moves back and forth between discussing health and health care, which may at time be a source of confusion for the reader. In discussing health care, the word “services” could be added to health care. In discussing health it might at times be appropriate to use “health status” or “health outcomes” instead of “health”. But the social scientists use “health” in their writings. For example, the titles of two recent books are: “Income Inequalities and Health”ⁱ and “Social Determinants of Health”ⁱⁱ. It seems better to warn the reader about potential confusion rather than alter the term “health” when it may not be appropriate to do so.

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ⁱ The Society and Population Health Reader: Income inequalities and Health. Kawachi I, Kennedy BP, Wilkinson RG (Eds.) 1999. New Press, New York.

ⁱⁱ Social Determinants of Health.. Marmot M and Wilkinson RG (Eds.) 1999. Oxford University Press.

Introduction

Since 1985 there has been a substantial increase in the number of studies about the relationships between socioeconomic factors and health. In an article published in 1999, Nancy E. Adler and Joan M. Ostrove¹ sketched the evolution of the theoretical framework now being used in studying disparities in health. They wrote that before the mid-1980's, SES was largely absent in studies on health -- except as a control variable. Studies focused on poverty and its association with health. The model used was based on a threshold effect: the health of people below the poverty level was believed to increase as their income increased and reached the poverty threshold, but above the poverty threshold, the level of health was constant as income increased. However, in March, 1987, at a conference in Menlo Park, California, sponsored by the Kaiser Family Foundation, leading social scientists from the U.S. and Great Britain presented a number of papers that showed the effect of socioeconomic factors was much broader than just poverty—that many social and economic factors were related to health. Moreover, the papers showed a gradient effect between SES and health -- as SES increased, health increased. The conference resulted in the 1989 publication of *Pathways to Health*.²

The papers were groundbreaking -- and ushered in an era of profound intellectual and pioneering work to understand the effects of SES on health. A reading of *Pathways to Health* today shows that the Black Report (after Sir Douglas Black, committee chair) stimulated the thinking of many social scientists because the report found that gaps in health were greater than before the National Health Service was established in 1948. The Black Report became the underpinning of the belief that health care does not play a very important role in health because the NHS equalized access to health care yet the gaps in health worsened during the time the NHS was in effect. As an example, authors of one paper in *Pathways to Health* wrote: “Patterns of utilization in Great Britain’s National Health Service have been considerably more equal than in the United States for over three decades, yet the 1980 Black Report showed that social class differentials in health are wider now than they were when the Health Service was established in 1948. The report attributed these differentials not to failings of the Health Services, but rather to the many other social inequalities that impinge on health, and it called for social policy measures

to combat them.”³ Another author noted that: “Differences in utilization of medical services do not appear to be the principal reason for the socioeconomic gradient in health in the United States or Great Britain. Although the wealthy can afford comprehensive health insurance and go to the best doctors when they become ill, they do not receive substantially more medical care. The poor in America are seen in physicians’ offices and hospitals as frequently as the middle class and wealthy,”⁴ and quoted figures from NCHS for 1985 that showed the lowest income families averaged 5.8 physician visits while the highest income families averaged 5.4 physician visits.

The thinking of social scientists during the 1980s and 1990s about health care was summed up by Robert and House: “Most research suggests that access to medical care plays a relatively minor role in explaining socioeconomic inequalities in health.....socioeconomic differences are seen both in diseases that are amenable to medical treatment and in diseases that are not amenable to medical treatment ...with deaths from diseases amenable to treatment representing only a fraction of all deaths in any case.....”⁵

At the same time, one of the papers included in *Pathways to Health* -- with remarks from conference participants -- indicated that one participant commented “Evidence indicates the beneficial impact of interventions on the health of children. This evidence shows that the frequency of occurrence of preventable conditions declines in response to the provision of medical care.”⁶

It is important to emphasize that the data available during the first 25 years of Medicare led nearly every researcher who studied the Medicare experience to assume that access to health care was equalized for those entitled to participate. Before Medicare, minority and elderly poor received inpatient hospital care at a much lower rate than elderly whites and more advantaged persons. By 1986, 20 years after Medicare was in effect, the hospitalization rate for black beneficiaries actually exceeded the rate for white beneficiaries. However, in the 1990s when more detailed data became available, it became clear that overall rates of physician visits and hospital admissions were not sufficient for analyzing access, utilization, and quality of care.

We do not know how great a role medical care plays in explaining disparities by race and SES in health status. What is known is that patterns of health care utilization among the healthiest elderly differ from those of the least healthy; and the patterns of health care use among the healthiest are those experts in health care recommend – a concentration on prevention and health promotion. Recent studies indicate, moreover, that people who use preventive services tend to exhibit behavioral characteristics – such as quitting smoking – that are also associated with good health,⁷ suggesting that the role of medical care will be difficult to disentangle from lifestyle and other factors that affect health status. Since Medicare began, life expectancy has increased for blacks and whites, but, similar to the experience in Great Britain, gaps in health have worsened among the population aged 65 and over during the time Medicare has been in existence.⁸

It is likely that one other aftermath of the Menlo Park conference is that U.S. social scientists have tended to focus their studies on the effects of SES on health, without including race as an independent variable in their models. Very likely, the premise has been that differences in morbidity and mortality that are seen by race are reflections of differences in social and economic factors. However, in recent years social scientists have noted that “studies may need to address how class-related experiences of racial/ethnic and gender discrimination may harm health”.⁹

Some social scientists – in recognition of the complex theoretical framework formulated for studying the effects of social and economic factors on health – use the concept of socioeconomic position (SEP), which they see as more reflective than SES of the social and economic factors that influence health. SEP is discussed later. However, for ease of discussion this paper continues to use SES.

The primary purpose of this paper is to consider ways of operationalizing and assessing the effects of SES on health care, particularly ways that are feasible in the short-term and in the

longer-term development of the NHDR. This paper includes race and ethnicity in relevant discussions about disparities in health care. In the past, race was used in studies about health care primarily because it was available, although it was often seen as a proxy for income. Now, race and ethnicity are used, not as proxies for income but along with SES, as variables associated with disparities in health care.

To focus this paper first on a discussion about methods used in studying the effects of SES on health from the later discussion about methods used in studying the effects of SES on health care, the paper is divided into four sections. Part I is an overview of the methods social scientists use in studying SES and health. Part II is an overview of what national experts consider essential in assessing access, utilization, and quality of health care. Part III is an overview of methods researchers use in studying disparities in health care. Part IV looks forward to a national health care disparities report.

To my knowledge, the current effort by the IOM is the first attempt to review methods social scientists use in studying the effects of SES on health to determine what is applicable to studying disparities in health care. Cross-fertilization of knowledge promises to be beneficial all around. The dissemination of information about disparities in the use of nearly every service covered by Medicare has helped to change the perception that health insurance assures equal access and use of health care.¹⁰ An example of the beneficial effects of cross-fertilization of knowledge from the social scientists – and one that is central to this paper -- is the recent recognition by researchers that SES is an important variable in studying disparities in health care, particularly disparities by race and ethnicity.

Part I: Overview of methods social scientists use in studying the effects of SES on health

In the U.S. there are a significant number of social scientists, primarily in academic settings, engaged in studying the association between SES and health; they have produced an extensive body of literature that is often related to the work of scholars from abroad.

The breath and scope of the research that has taken place about the effects of SES on health can be seen in the Annals of the New York Academy of Sciences, Volume 896, 1999, which contains papers from a conference held at NIH, May 11-12, 1999, entitled, Socioeconomic Status and Health in Industrial Nations, Nancy E. Adler, Michael Marmot, Bruce S. McEwen, and Judith Stewart (Eds.).¹¹ This conference brought together international experts to present their theories and empirical findings. The Annals -- along with a paper providing an overview about measuring social class by Nancy Krieger, David Williams, and Nancy Moss¹² and a book chapter that reviews methods used in measuring inequalities in health at different levels (individual vs. group-level) by S.A. Robert and J.S. House¹³ -- illustrate the extent of research about the effects of SES on health, the substantial number of scholars here and abroad, and the knowledge gained from their research.

As might be expected from the inherent complexity of social science, there is no simple summing up or overwhelming agreement about the causes of disparities in health, why gaps in health are growing, what to do about them, or how to study the issues. Authors of the book chapter wrote: “we still do not well and consensually understand why socioeconomic inequalities in health exist and persist, nor what policies are most likely and necessary to reduce these inequalities” (Robert and House.)

Nonetheless, there are many points of agreement and lessons to be learned from the literature about the effects of SES on health. Four important lessons are discussed next; how each lesson applies to studying the effects of SES on health care is noted at the end of each lesson.

Lesson 1. The field of research about the effects of SES on health (sometimes termed health status or health outcomes) is still new. The link between SES and health is not well understood. There are likely to be many different pathways connecting SES and health. This means that a broad perspective is needed to understand the multiple pathways linking SES and health. To gain an understanding of these pathways requires studying the effects of different measures of SES (income, wealth, education, occupation, and other variables) and using different levels of analysis –individual, household, neighborhood, and area.

This lesson speaks to two fundamental questions about methods of study: (1) Among the variables used as measures of SES (most commonly income, education, and occupation), is there a best measure of SES? (2) Among the various approaches used to analyze the effects of SES (individual-, household-, or neighborhood-level), are some better than others? The answers are, in general, “No”. There are inherent imperfections and limitations in all of the measures of SES – just as there are in measures of race and ethnicity. But when used thoughtfully each measure can have its own ring of truth.

In their paper, Krieger, Williams, and Moss (cited earlier), recognized experts in the field, write about the fundamental requirement of research -- a clear conceptualization of what is being studied and why. Their own work is based on a theoretical framework grounded in the social sciences, and structured around subtle concepts that are included in the concept of socioeconomic position. They write that social class refers to “social groups growing from interdependent economic relationships” and that “exist in relationships to and co-define each other”, e.g., employers and employees. They note the differences between socioeconomic status -- a concept that refers to actual resources such as income or a high-school education and socioeconomic position (SEP)—“an aggregate concept that includes both resource-based and prestige-based measures,” the later referring to rank or status in a social hierarchy, “typically evaluated with reference to people’s access to and consumption of goods, services, and knowledge, as linked to their occupational prestige, income, and education level.” Krieger et al use SEP because SES “blurs distinctions between the two different aspects of social and

economic position: (1) actual resources and (2) status, meaning prestige- or rank-related characteristics.”

As noted, research about the effects of SES on health is relatively new, gaining momentum only in the mid-1980s. Perhaps not unexpectedly then, studies about SES and health frequently lack a clear conceptualization of what is being studied and why a particular SES measure is used. In fact, measures and methods are sometimes chosen because of the availability of data rather than theoretical premises. For example, in the U.K. occupation is used more frequently in studies about disparities in health, while in the U.S. income and education are used more frequently, the choices due, in part, to custom and the type of social and economic information collected.

Recently, the use of composite measures has gained attention. Different composite measures of deprivation, relating to material and social disadvantage, have been developed for studying SES on the individual and area levels.¹⁴ Composite indices are generally constructed by combining information (often from a national census) about factors such as income, employment, communications, transportation, support, education, owned home, and living space. Peter Townsend and Carstairs and Morris, in the U.K., both introduced composite indices for area-level analyses based on four factors. Three factors included in each of the indices are unemployment, lack of a car, and overcrowded housing; for the fourth factor the Townsend index uses home ownership and the Carstairs index uses lower social class.

Composite indices for area-level analyses have been used in different ways. They may be particularly useful as area-wide planning tools. For example, in the 1960s, the Planning Department in Baltimore City designed a composite index for census tract areas, based on a several social and economic factors. The index was used to rank census tracts from the most advantaged to the most deprived. For an experimental program set up in Baltimore in the 1970s, census tract rankings were used to establish a health program for children and youth in census tract areas that were most deprived.¹⁵

A Quebec study provides some insight into the potential difficulties in interpreting results of area rankings from a composite index of deprivation. Comparisons between area rankings and factors used in the index showed that areas deprived socially were not necessarily deprived materially, and vice versa. Thus, the Quebec study provides a cautionary note that “lumping” SES measures together can be confounding because the index does not necessarily provide a measure of area-level SES that can be readily interpreted.

Another study illustrates the effectiveness of using a composite index as a contextual variable. The study analyzed risk factors of women who had experienced violence in the home. Individual SES measures did not help to identify risk factors among the women but analysis of areas where women lived (ranked by a composite index of social and economic deprivation) showed that the rate of violence varied significantly by area of residence.¹⁶ This example illustrates the fact that individual-level measures of SES integrated with area-level measures of SES can bring additional insights.

In their review of methods used in studying SES and health, Robert and House, conclude that questions about which measures and methods to use “remain unanswered and perhaps unanswerable in a generic sense”. Moreover, there are many remaining methodological problems relating to studying the effects of SES on health. These problems include: (a) the lack of precision and reliability of various measures as well as difficulties in generating SES measures, (b) unresolved questions about how to measure the effects of SES over the life course because social and economic factors may change from birth, to childhood years, to adolescence, to adulthood, to old age, (d) some SES measures that are useful for studying their effects within some races and ethnic groups may not be useful for other races and ethnic groups; this same methodological issue applies to gender; (c) a lack of understanding about why the relationships between SES and health are stronger for men than for women, (d) how to classify married women, the unemployed, and retired persons in a household; (e) the fact that mental and other psychosocial factors that affect health are difficult to include in measures of SES, and (f) the intertwining of race/ethnicity and SES and how to assess the separate effects.

The list of unresolved conceptual and measurement questions is long, albeit experts such as Krieger et al offer some recommendations, including using additional SES factors such as wealth and sexual preference, using smaller areas for area-level analysis of SES effects (e.g., neighborhoods or block groups) rather than ZIP code areas that are often large and not homogeneous, and using individual SES measures instead of composite indices.

Applicability to studying the effects of SES on health care: This overview of measures and methods used in research studies about the effects of SES indicates that there is no one best measure or methods. The choice of a “right” measure depends upon the study. However, there are some compelling reasons to choose some SES measures over other measures. These reasons will be discussed in Part IV of this paper.

Lesson 2 comes from the perspective held by sociologists and social epidemiologists about the direction of the relationship between SES and health -- that is, whether health status drives socioeconomic status or whether SES drives health. While some economists believe the force of the vector is that health drives SES -- because poor health has a negative effect on job opportunities and socioeconomic position (social drift) -- most social scientists believe the force of the vector is the other way around. That is, the major force in the link between SES and health is that SES affects health (social cause).

Applicability to studying the effects of SES on health care: This lesson is relevant to studying the effect of SES on health care. Among those who have studied disparities in health care, there is a consensus that biological, genetic, and health status differences by race account for very little of the persistent disparities in health care. Similar to the force of the vector in health-- race, ethnicity, and SES also drive health care, and not the other way around. However, this lesson must be tempered with careful analyses because diseases such as hypertension, diabetes, and osteoporosis are not uniformly distributed in the population. Such differences must be recognized because they can lie at the crux of the credibility of studies showing disparities in health care. This issue will be discussed in Part IV of the paper.

Lesson 3 comes from the fact that social scientists ceased using SES as a control variable when they recognized that health was affected not only by poverty but by a much broader set of variables including income, education and occupation. Thus -- if the intent is to understand factors that affect disparities in access, utilization, or quality of care-- SES should not be used as a control variable.

Applicability to studying the effects of SES on health care: Learning this lesson is critical to studying the effects of SES on health care, especially in relatively new areas of research. For example, suppose it were found that on average highly educated people rate health plans better than less educated people. It could be hypothesized that this consistent pattern biases the ratings and therefore controlling for education across plans is warranted. However, better-educated members of a plan may get better health care if their interactions with the plan are more successful; for example, they may experience less waiting time for appointments or they may be more successful getting referrals to specialists than less educated members of the plan.¹⁷

Lesson 4 comes from the axiom set forth by Krieger et al -- that research should begin with a careful conceptualization about what is being studied and why. This means that certain theories that have been useful in conceptualizing research studies about why SES is associated with health (such as the theory about the effects of income inequalities on health) will not necessarily be useful in conceptualizing research studies about why race, ethnicity, and SES affect health care.

Applicability to studying the effects of SES on health care: This lesson points to the need to develop a conceptual framework targeted toward understanding and ameliorating disparities in health care. Such a framework seems less likely to grow from theorizing abstractly than from a more concrete set of premises that could be tested. For example, a framework might evolve from theorizing how individuals and the health care delivery system interact -- in terms of behaviors of individuals, providers, and institutions; and how these interactions affect access, utilization, and quality of care. Behaviors have been shown to be a factor associated with the use

of preventive services, due, in part, because these services are often self-initiated.¹⁸ In essence, a conceptual framework is needed to formulate hypotheses about disparities in health care that might be tested, especially those that can help pinpoint potential agents of change.

As an example, elderly women with higher incomes and supplementary insurance are more likely to obtain mammograms than lower income women and women without additional coverage. Under Medicare, mammography requires a co-payment, which suggests that the co-payment may lead to the disparities associated with income. In every insurance category – Medicare only, Medicaid, and private supplementary coverage – mammography use rises with income¹⁹. Yet, there are even greater disparities in the use of flu shots, which are “free”. These facts do not rule out the effect of income but they do suggest that there are likely to be multiple pathways leading to disparities in utilization.

Part II. An overview of what national experts believe is essential to assessing access, utilization, and quality of health Care.

L. A. Aday, G. Fleming, and R. Andersen²⁰ defined “access” as having two dimensions ... “those dimensions which describe the potential and actual entry of a given population group to the health care delivery system.” Potential access is the dimension that refers to components of access that are related to availability of services; realized access is the dimension that refers to components of access that indicate whether services were actually used.

Potential access is measured by characteristics of individuals and of the health care system, and measures often used include health insurance coverage, having a regular source of care, indicators of availability of resources such as physicians:population ratios and hospital beds per capita, and other barriers to care such as costs of services and waiting and travel time. Household surveys often focus on measures of potential access.

Information about potential access is much more readily available than information about realized access. The major national health surveys such as the Medical Expenditure Panel Survey (MEPS) sponsored by AHRQ and the Medicare Current Beneficiary Survey (MCBS) sponsored by CMS focus on collecting different measures of potential access.

Realized access is measured by the actual use of services. Assessing the effects of SES on realized access requires information about the use of different types of services, such as the use of health promotion and disease prevention services, referral services (including diagnostic tests and surgery), pain management services, mental health services, aftercare and rehabilitation services, and long-term care. The sample size of household surveys is generally large enough to generate utilization rates for frequently used services, such as influenza immunization and mammography, but not for less frequently used services such as coronary artery bypass graft. Data sources that collect information for a large number of people, such as administrative data, surveys of hospital discharges, or statewide hospital discharge systems, are needed to generate utilization rates for the majority of medical and surgical services.

Both aspects -- potential access and realized access -- are essential dimensions in assessing access to care. The term “access”, however, is commonly used to refer to “potential access’ to health care, such as having a usual source of care or being insured. For ease of discussion, this paper will conform to the commonly accepted practice, and use the phrase “access and utilization” to mean potential and realized access.

Quality of care

In 1990, the Institute of Medicine defined health care quality as “ the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”

A conceptual framework for assessing quality of care was delineated by the IOM in their recommendations for the NHQR²¹. This conceptual framework for health care quality outlines two dimensions. The first dimension of quality has four components: safety, effectiveness, patient centeredness, and timeliness. The second dimension is consumer perspectives on health care needs –encompassing care associated with staying healthy, getting better, living with illness or disability, and coping with the end of life.

Part III. Methods researchers use in studying disparities in health care

Disparities in health care have been studied for many years—well before the health care programs of the 1960s. Early studies focused primarily on known “barriers to care”. Not having health insurance or a regular source of health care were identifiable obstructions in the way of obtaining health care. Once removed, it was expected that there would be equal entrance to the health care system. In the past decade, disparities in health care have led to the awareness that there are other barriers to health care, not well understood, that are related to race, ethnicity, and SES. Three principal approaches are used to study the effects of race, ethnicity, and SES on access, utilization, and quality of care.

One approach to studying disparities in health care is through information collected in nationally representative household surveys. The detailed data collected in these surveys provide a rich source of information to study the effects of race, ethnicity, and SES (income and education) on potential access, including proportions of the total populations and subgroups with health insurance coverage and with a regular source of care. Utilization rates can be generated for services that have relatively high rates of use, including preventive services, seeing a physician during the past year, or being hospitalized. A special strength of survey data is that utilization rates are not subject to inaccuracies created by multiple payers. However, health care services that are less common, such as heart procedures, cannot be analyzed using survey data because of small cell sizes.

A second approach is through information available in administrative databases. The major strength of administrative data is the number of records in the files, which is often large enough to develop population-based utilization rates for many different types of services. The major limitation of administrative data is the inadequate information about race and ethnicity and the lack of clinical information about the need for certain services, such as a particular heart procedure.

A critical factor in the use of administrative data is whether reliable information is available to generate denominator data that correspond to the numerator data. In general, denominators can be generated using Medicare, Medicaid, and VA administrative data. Over time, changes can threaten the reliability of administrative data, such as enrollment in managed care plans, although analysts have devised ways of adjusting for HMO enrollment.

To overcome the absence of SES data, Medicare data were linked in 1995 to U.S. census data on a Zip code basis to study the effects of race and SES on health care. This approach was based on studies that validated the use of aggregate SES data from the census as a proxy for the SES of an individual²², with the understanding that the proxy SES measure reflects both the characteristics of the individual and the area where the individual lives. The match was incomplete for 4 percent of white beneficiaries and 6 percent of black beneficiaries because of unmatched Zip codes or missing income data on the census files, and these beneficiaries were excluded from the study. The Medicare Current Beneficiary Survey was used to validate this approach.²³ It was intended that the Zip code analyses would be refined in future studies by using census tracts aggregations. However, that approach was abandoned for methodological reasons, including the fact that about 30 percent of addresses in the U.S. do not have a census-tract.

For some services covered by Medicare, disparities by race are strikingly high. As examples, each year during the period 1993-97, the percentage of elderly blacks who received a flu shot was only about one-half that of elderly whites. In 1998, elderly blacks received 19 percent fewer physician office visits, 12 percent fewer ophthalmology visits, 38 percent fewer sigmoidoscopies, 16 percent fewer colonoscopies, and 31 percent fewer cataract removals. But among elderly whites, a gradient can be seen in the use of services -- as SES increases the use of preventive and health promotion services increases. The same is generally true among elderly blacks.

From analyses of Medicare administrative data for all covered services, three distinct patterns have become evident: compared to whites and more advantaged beneficiaries of both races,

blacks and less advantaged beneficiaries: (1) use fewer preventive and health promotion services such as influenza immunization and mammography; (2) use fewer diagnostic tests such as colonoscopy and undergo fewer common surgical procedures such as coronary artery bypass graft, but (3) use more of the types of procedures that are associated with poor management of chronic disease, such as excisional debridement and amputations of part or all of the lower limb.²⁴

Recent studies show that utilization of preventive services are associated with behavioral patterns. Within all groups, no matter what race, income, and educational level – persons who use any one preventive service (or quit smoking) are more likely to use a second preventive service than those who did not use the first service (or are current smokers).²⁵

A third approach is through patient-based studies to analyze treatments and quality of health care viz-a-viz the patients' need for medical and surgical care. The strength of patient-based studies is that they generally draw upon data sources containing clinical information, such as hospital medical records. One limitation in patient-based studies is that they are not likely to be nationally-representative. Moreover, they do not reflect the population-at-risk of needing the treatment. Nonetheless, they are a rich source of information for analyzing quality of care. A number of patient-based studies have used a database established from the linkage of information available in the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program with information available in the Medicare administrative data system. The SEER/Medicare database has also been linked to U.S. census data on a Zip code basis, resulting in a unique source of information for studying the effects of race and SES on disparities in the incidence and treatment of cancer, the second leading cause of death in the U.S.

Overall, these population-based and patient-based studies about disparities in health care have assessed disparities in health care in ways that have been consistent with Aday et al definitions of potential and realized access, and the IOM's definitions of quality of care. Notwithstanding the fact that studies about disparities in health care have used reliable data and generally appropriate methods and concepts about access, use, and quality of care, many of the studies share the same

limitations and failings as studies about disparities in health -- the frequent absence of coherent and consistent measures of race, ethnicity, and SES.

Also absent is a well-conceived theoretical framework on which to base studies about disparities in health care. The causes of disparities in health care are likely to be complex, involving characteristics of individuals and the health care system. For example behavioral characteristics of individuals may lead to disparities in preventive services that are self-initiated such as flu shots or mammograms but little is known or conjectured about what characteristics in the health care system lead to disparities by race and SES in surgical procedures such as joint replacements or referral –type services.

Part IV. Looking forward to a national health care disparities report.

There is a wealth of data about access, utilization, and quality of care in the U.S. that could serve as a foundation for a report on disparities in health care. The challenge will be to turn the data into information that is meaningful and captures the attention of policy makers and the nation.

As background information, disparities in the use of Medicare services have been shown in eight annual reports to Congress from 1994-2001. These reports have been in response to the Omnibus Budget Reconciliation Act of 1989, which introduced a new system for paying physicians and required “the Secretary of the Department of Health and Human Service to monitor and report annually to Congress on changes in utilization, and access, by population groups, geographic areas, types of services, and on possible sources of inappropriate utilization”.

The reports, prepared by HCFA, responded to the central question in the mandate: whether the new payment methods changed access and use of health care. The 1994 report showed that the introduction of the new payment system did not produce any detrimental effects on access and use of services, but the more detailed data, required by the new payment methods, revealed that there were substantial differences by race in the use of nearly every medical and surgical service covered by Medicare. The following year census data by ZIP-code were linked to Medicare data, and the 1995 report showed disparities in utilization not only by race but also by SES. The 1994 and 1995 reports were published²⁶; subsequent reports were shorter and submitted to Congress in typed copies. The table in the Appendix illustrates the substantial disparities in Medicare utilization, by race and SES, shown in the 1995 report to Congress.

These reports succeeded in bringing the issue of disparities in the use of Medicare services to the attention of many in the Department of Health and Human Services, but – to my knowledge – did not capture the attention of policy makers or others in the nation. Very likely part of the explanation is that the issue of disparities in Medicare was not central to the purpose of the report-- whether payment reform presented new problems. Perhaps more importantly, disparities

in Medicare utilization were shown-- without providing any discussion about why the disparities in health care matter.

The mandate for the NHDR provides the first opportunity to focus solely on the issue of disparities in health care, and for all age groups. To seize this opportunity and create a national health care disparities report that is meaningful, it may be helpful to approach the design of the report by considering two fundamental questions:

- First, why should disparities in health care matter to policy makers and the nation?
- Second, what information provides evidence that disparities matter?

First, why should disparities by race/ethnicity/SES in health care matter to policy makers and the nation?

Disparities in health care are counter to our society's core values of justice, fairness, and equity. Prior to 1965, the fact that minority persons and the poor used fewer physicians' services and were admitted to the hospital less frequently than persons in better economic circumstances raised public policy concerns, leading to enactment of programs such as health insurance for the elderly and the poor. Current studies show that minorities and less advantaged persons still have less access and obtain poorer quality care, even those with health insurance coverage, than more advantaged persons. This raises anew the same concerns about the exclusion of vulnerable persons from appropriate and needed health care that motivated the enactment of the landmark health care programs of the 1960s.

Differences in current rates of hospitalization suggest the detrimental effects of ineffective patterns of health care. In 1999, the rate of hospitalization for non poor persons was 247 hospital discharges per 1,000 persons; the rate for the near poor was 329 discharges per 1,000; the rate for the poor was 395 discharges per 1,000, or 60 percent higher than the rate for the non poor.²⁷

Disparities in health care are a particular concern now because gaps in health – by race and income-- are growing. Undoubtedly, factors other than health care affect health -- e.g. public health measures relating to the environment (e.g., water, air, sanitation), nutrition, housing, and lifestyle. But subgroups of the population most at risk of poor health outcomes receive fewer services that promote health and prevent disease than the healthiest receive. Moreover, these disparities in health care occur not only among those in the population without health insurance, but also among minorities and disadvantaged persons with health insurance coverage.

Yet, the first NHDR could puzzle policy-makers if they recall studies in the 1970s and 1980s by John Wennberg and colleagues about variations in the use of health care services by geographic area; these studies showed that differences in utilization across geographic areas do not reflect differences in need but rather are related primarily to availability of resources and different practice patterns in the areas.²⁸ Variations by geographic area suggest that health care use is often inefficient; to some persons these studies mean that the “right” rate of utilization is probably the lowest rate. In the 1980s, Congress responded to concerns about geographic variations by mandating changes in government payment policies to reduce unneeded physicians’ services and hospitalizations. Although studies about geographic variations make the case that the use of services does not necessarily reflect need, a carefully designed health care disparities report can also make the case that the need for services –especially the need for services that help vulnerable persons stay healthy -- is not reflected in many patterns of utilization.

Second, what information provides convincing evidence that disparities matter?

The effectiveness of a report about disparities in health care depends upon the extent to which it helps define the issues. In essence, disparities in health care matter in light of the significant gaps by race and SES in health status. How great a role medical care plays in explaining inequalities in health is unknown. But health care and health outcomes -- when viewed together -- are convincing evidence that patterns of care among vulnerable subgroups are not consistent with current professional knowledge and not likely to produce desired outcomes. A prime

example is that for nearly every site of cancer the stage of cancer for black persons is more advanced when first diagnosed than for white persons. Appropriate health care, in terms of early detection, would indicate that black persons need at least the same or higher rates of cancer screening services as white persons, but the reverse is generally true.

Linking disparities in health with disparities in health care is likely to capture the attention of policy makers and the nation. Since no measure of SES is clearly better than another, SES measures for the NHDR could be selected based on criteria such as consistency and coherence. The relationship between SES and health care is likely to be linear or monotonic rather than dichotomous; thus variables with three or more breakouts are desirable.

Criteria used in selecting health and health care information for the NHDR might include:

- Topics are recognized as important to health and health care, such as information on heart disease, cancer, stroke, low birth weight births. Topics dovetail when possible with the Healthy People 2010 goals and the NHQR.
- A credible connection can be made between the use of a health care service and the health outcome.
- General consistency in measures (race/ethnicity/SES) for health and health care.
- Different aspects of mortality, morbidity, and disability are represented.
- Different aspects of access, utilization, and quality of care are represented.
- Different types of services and different age groups are represented.
- Information is shown by race and ethnicity, broken-out by SES.
- The information is scheduled for update annually.

Population-based analyses

An example of using these criteria follows. Tables 1 and 2 below (from tables 13 and 75 in Health U.S., 2001) could be considered as logically related, based on studies that show mothers who were healthy girl are more likely to have healthy babies than unhealthy girls.

Table 1. Low-birth weight live births among mothers 20 years of age and over, U. S., 1999.

Percent of live births weighing less than 2,500 grams

Less than 12 years of education

All mothers	8.3
White-non Hispanic	9.2
Black –non Hispanic	15.2
Am.Ind/Als.Native.	8.1
Asian/Pac.Islander.	7.1
Hispanic	5.9

12 Years of education

All mothers	8.0
White-non Hispanic	7.0
Black –non Hispanic	13.4
Am.Ind/Als.Native.	6.9
Asian/Pac.Islander.	7.4
Hispanic	6.2

13 years or more of education

All mothers	6.6
White-non Hispanic	5.8
Black –non Hispanic	11.7
Am.Ind/Als.Native.	6.1
Asian/Pac.Islander.	7.2
Hispanic	6.2

Source: Table 13, Health, U.S., 2001. NCHS National Vital Stat. System.

Except for Asian and Hispanic origin mothers, the mother's education is associated with birth weight for each race (table 1). For white births the percentage of low birth weight babies fell from 9.2 for mothers with less than 12 years of education to 7.0 for mother with 12 years of education to 5.8 for mothers with 13 years or more of education – a decline of **63** percent. For black births the percentages fell from 15.2 to 13.4 to 11.7 – a decline of **77** percent. For American Indians, the decline went from 8.1 to 6.9 to 6.1 – a decline of **75** percent. For Asian and Hispanic births the percentages moved up or down a little but no clear trend is apparent.

Table 2 is for children under age 19 and shows that race, Hispanic origin and poverty status are associated with not seeing a physician in the past year. Table 2 may not be ideal in terms of consistency because the SES measure is poverty (poor, near poor, and non poor.) while the SES measure in Table 1 is educational level. (MEPS could be used to generate a new Table 2 using education as the SES measure) Nonetheless, table 2 is an example in which the SES measure used -- poverty level – may be particularly useful. The table shows that white, black and Hispanic children who are not poor are least likely to be at-risk of not seeing a physician in the past year. But for white and black children being near poor puts them at a greater risk of not seeing a physician than being poor, perhaps because they are less likely to have Medicaid coverage compared to the poorest children under age 19.

Viewed together, the tables suggest that if disparities in the health care of children under age 19 were reduced, disparities in low-birth weight births may be reduced also.

Table 2. No Health Care Visits to an Office or Clinic within past Twelve months among children 18 years or younger, 1999.

Percent of children without a health care visit

Poor	
White-non Hispanic	13.4
Black –non Hispanic	16.4
Hispanic	26.2
Near poor	
White-non Hispanic	14.7
Black –non Hispanic	17.7
Hispanic	22.7
Non poor	
White-non Hispanic	9.1
Black –non Hispanic	10.3
Hispanic	13.4

Source: Table 75. Health States, 2001. Basic source: NHIS

To make a convincing case about disparities in health care, it will be important that the NHDR cover several aspects of health and health care but at the same time be selective in providing illustration in order not to overwhelm the intended audience.

Potential topics using population-based studies:

Health	Health care
% with diabetes; % hypertension....paired with.....	Ambulatory physician visit rates
% ADL limitation paired with.....	Joint replacements
Cancer stagepaired with.....	mammograms, colon screenings,
Low birth weight births paired with.....	... health insurance; usual source of care
pneumonia and influenza cases.....paired with.....	flu shots

Patient –based analyses

Each annual report might include a section with selected patient-based studies. Two examples are provided below. Table 3 shows the rate of resection of patients diagnosed with resectable non-small-cell lung cancer, by race and SES, newly diagnosed during the period 1985-93.

The study used the SEER/Medicare database linked to U.S. census data on a Zip code basis. Disparities in the rate of resection are evident by race and income. The total surgery rate for white patients was 76.7 percent; the total surgery rate for black patients was 64.0 percent. For black patients in the lowest income quartile, the rate was 61.9 percent but for those in the highest 3 quartiles the rate was 67.5 percent. For white patients, the rate was 70.7 percent in the lowest income quartile but for those in the highest 3 quartiles the rate was 78.0 percent.

Table 3. Rate of Resection by race and median income in Zip code area of residence

Median income in Zip code area of residence	Total	Study Patients: Number		Resection Percent	
		Black	White	Black	White
All Patients	10,984	860	10,124	64.0	76.7
Lowest quartile	2,358	451	1,907	61.9	70.7
Highest 3 quartiles	7,203	289	6,914	67.5	78.0
Not determined	1,423	120	1,303	63.3	78.2

Source: Bach PB, Cramer LD, Warren JL, Begg, CB. Racial differences in the treatment of early-stage lung cancer. N Engl J Med Oct. 14, 1999. Table 2.

Table 4 provides another example of a patient-based study. It shows rates of different procedures following acute myocardial infarction. The percent of patients with each of the procedures shown was higher for white patients compared to black patients. (an SES variable was not shown.)

Table 4. Racial variations in cardiac procedures following AMI,1988-1990.

Procedure utilization within 90 days of AMI	White Pts. Black Pts.		White Pts. Black Pts.	
	Number:		Percent with:	
	29,119	4,522		
Cardiac catheterization	10,745	1,524	36.9	33.7
CABG	2,795	231	9.6	5.1
PTCA	1,805	190	6.2	4.2
Any revascularization	4,455	406	15.3	9.0

Source: Peterson ED, Wright SM, Daley J, Thibault GE. Racial variation in cardiac Procedure use and survival following AMI in Dept. of VA. JAMA. April 20, 1994.

THE FIRST NHDR

The first NHDR could focus on calling attention to a fundamental issue in health care -- disparities in the use of preventive services. It could highlight disparities in preventive services for children and those related to heart, cancer, and stroke. Using extant data the NHDR could illustrate disparities in preventive health care juxtaposed against disparities in health outcomes:

DISPARITIES IN HEALTH CARE

Measures of potential access to care, by race/ethnicity/SES, could include:

Health insurance coverage (with a focus on the uninsured by race/ethnicity/SES)
Usual source and site of care

Measures of realized access by race/ethnicity/SES could include:

Visited a doctor in the past year
Well baby and Dental care
Childhood immunizations
Mammography and pap smears

Colon cancer and PSA tests
Carotid endarterectomy

DISPARITIES IN HEALTH (i.e., Health Status, health outcomes)

Measures by race/ethnicity/SES could include:

All cause mortality (and heart, cancer, stroke death rates) and infant deaths.
Life expectancy at birth, at mid-life, at age 65.
Morbidity and Disability:
Asthma, diabetes, hypertension, end-stage renal disease
Self-reported health status, ADLs
Dental caries
Stage of cancer at diagnosis for leading sites of cancer and 5 year survival rates

Overview of Frequent Methodological Problems in Studies of Health Care Disparities

The use of SES measures is relatively new in studying disparities in health care. Five frequently encountered problems are discussed below:

1. **Using census data for SES measures.** Databases that lack SES information have been linked with U.S. census data at the census tract or Zip code area level to assign an individual in the database the median income and educational attainment corresponding to his or her area of residence. For analytic purposes, individuals are often distributed into quartiles. If specifications for the quartiles are based on the income of the total population, then the distribution for blacks will be uneven, given the substantial differences between blacks and whites in income. Table 3 above illustrates this problem. The study had a total of 10,984 patients; 860 patients were black and 52 percent of the black patients fell into the lowest income quartile. Evidently, the three highest quartiles of patients were grouped together to overcome the problem of small cell size. Experience with this approach has shown that the problem could be avoided if income quartiles were specified separately for blacks and for whites. However, researchers are often limited to using databases specified by others and therefore not readily altered.
2. **Small cell sizes even with large samples.** Except for preventive services, utilization rates may be relatively low. Even with large databases cell sizes may be too small to analyze rates by age, sex, race, ethnicity and SES. Table 4 illustrates this problem. As shown, this study had 29,119 white patients and 4,522 black patients. This study was published in 1994, a time when SES had not yet been commonly used in studying disparities in health care. Had SES been included in this study, sample size would have been sufficient. But had the data also been broken out by age and sex, cell sizes for black patients would be too small.

3. **Differences by race and ethnicity in risk factors.** Linking health with health care requires that differences in risk factors be recognized. For example, more whites have osteoporosis; thus, it is expected that whites will be hospitalized more frequently for hip fracture repairs. Blacks have higher rates of diabetes than whites; this condition may result in limb amputations. The Appendix table shows that the rate of amputations for blacks was 3.64 times the rate of whites. To discuss these findings require input from clinicians -- that is, the differences between blacks and whites in amputation rate are far higher than expected from the differences in diabetes rates. (Relevant literature should be cited.).

4. **Data for persons in managed care plans.** Data are generally not available to study the effects of race and SES on utilization in managed care plans. Policy papers have discussed the inadequacy of current information from health plans to assess disparities by race and SES.²⁹

5. **Choosing an SES measure.** Table 5 is a tabulation showing the percent of white and black women who received mammograms, flu shots, and pap smears in 1998 -- by income and by education. The upper bank of data shows that among white women, higher income women were more frequent users than lower income women. The same is true for black women. Comparing women by race, the rates for higher and lower income white women are greater than the corresponding rates for black women, except for mammography, where the rate for low income black women (43percent) is higher than the rate for white women (42 percent).

The lower bank of data shows generally similar patterns, but the percents using the preventive services are generally lower. It is important to note that the number of women who fell into the income and education groups differs substantially. For example, among white women, more than twice as many fell into the low-income group (11,434,000) as the number who fell into the low-education group (5,472,000). Among black women, the shifts are dramatic. About 9 times as many black women

fell into the low education group (985,000) as the number who fell into the low income group (111,000). In general, these data show that there are disparities in the use of these three preventive services by income and education, although the level of disparities often differs. The decision whether to use income or education as an SES factor depends upon what is being studied and why.

Table 5. Racial Difference in Use of Mammography, Flu shots, and Pap smears: by income and by education, 1998.

	White women		Black Women	
	High income	Low income	High income	Low income
	N=4,625*	N= 11,434*	N=1,427*	N=111*

Percent of women:				
Mammography	60	42	55	43
Flu shots	74	68	62	51
Pap smear	46	30	36	30

	White women		Black Women	
	High School	Less than HS	High School	Less than HS
	N=10,587*	N= 5,472*	N=553*	N=985*

Percent of women:				
Mammography	52	38	51	40
Flu shots	73	63	53	51
Pap smear	38	26	38	25

Source: Medicare Current Beneficiary Survey, 1998.

* Number in thousands.

High income: \$25,001 or more; low income: \$25,000 or under

Summary

The NHDR provides a major opportunity to focus attention on disparities in health care in the U.S., especially disparities in preventive and health promotion services. Incorporating knowledge from the social sciences about studying SES and health will help to put the health care disparities report on a sound scientific footing. No one SES measure or approach is clearly better than others for studying disparities in health care because income, education, occupation, wealth and many other measures of SES on the individual level and area level may be associated with disparities in care.

The vast amount of information available in U.S. data systems as well as articles about disparities in health care can serve as a foundation for the NHDR. Disparities in health care are likely to be more meaningful to Congress and the nation if the NHDR provides information that indicates disparities matter. The challenge will be to distill creditable information to illustrate how race, ethnicity and SES are associated with disparities in health and in health care.

A table summarizing strengths and limitations in using specific SES measures follows.

Summary of SES Measures: Methodological Issues, strength, limitations for studying disparities in health care.

<p>1. Income</p>	<p>From surveys:</p> <ul style="list-style-type: none"> . Pros: Household income generally accepted SES measure for studying health care or health. Three or more breaks preferred but cell sizes may permit only 2 breaks (high – low). See table 3 . Cons: May not be a fully coherent measure for persons with insurance. <p>From U.S. census data:</p> <ul style="list-style-type: none"> . Pros: Median income in Zip code is a generally accepted measure (has been validated in 1 study; also N EngJ Med and JAMA have accepted such studies for publication.) Median income in a Zip code is not only a proxy for individual income but also reflects characteristics of the area where an individual resides, and may indicate availability of resources. . Cons: Smaller areas such as census tracts would be preferable, but only 70 percent of addresses are census tracts.
<p>2. Education</p>	<ul style="list-style-type: none"> . Pros. Comments about income generally apply to education. But education may be a more coherent measure, especially in

	<p>analyzing use of services such as preventive services that are often self-initiated.</p> <p>.Cons. none.</p>
3. poverty level	<p>.Pros. Can be a more sensitive economic SES measure than income, suggesting how Medicaid affects access and utilization.</p> <p>.Cons. Not as readily accepted by public because of concerns about what the levels mean.</p>
4. occupation	<p>.Pros. No experience to judge its strengths.</p> <p>.Cons. Could be used in studies based on household surveys, but not using U.S. census data for SES information since a summary measure of occupation not available..</p>
5. wealth	<p>.Pros. A useful SES measure for analyzing access to health services that are costly and not generally covered by insurance, such as nursing home care.</p> <p>.Cons. For services covered by insurance, not a commonly used SES measure.</p>
6. Area measures of SES such as deprivation indices	<p>.Pros. The degree of deprivation or advantage of the area of residence is likely to be a sensitive measure of access, use, and quality of care. Could add contextual information in conjunction with individual measures of SES.</p> <p>.Cons. Lumping various indicators together becomes somewhat of a black box.</p>

Appendix table

Medicare: rates for selected services, by race and income, 1993.

(Rates: per person for ambulatory visits; per 100 persons for emergency room and mammography; per 1,000 for lower limb amputations)

Race and Income	Ambulatory physician visits	Emergency Room physician visits (ER)	Mam-mography	Amputation of all or part of lower limb
White beneficiaries				
Total	8.1	35.0	26.0	1.9
\$20,501 and over	9.0	29.6	31.0	1.5
\$16,301 to \$20,500	8.3	34.6	27.2	1.8
\$13,101 to \$16,300	7.6	36.8	24.1	2.1
less than \$13,001	7.3	39.9	20.8	2.2
Black beneficiaries				
Total	7.2	50.6	17.1	6.7
\$20,501 and over	8.0	44.2	20.4	5.8
\$16,301 to \$20,500	7.4	45.8	19.9	5.9
\$13,101 to \$16,300	7.7	52.2	21.1	6.1
less than \$13,001	7.1	51.6	16.0	7.0

Black/White Ratio

Total 0.89 1.45 0.66 3.64

Income Adjusted 0.93 1.37 0.75 3.30

Source: 1995 report to Congress. See Endnote 25.

Endnotes

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- ² Bunker, JP, DS Gomby and BH Kehrer, Eds. 1989. *Pathways to Health: the role of social factors*. The Henry J. Kaiser Family Foundation, Menlo Park, California.
- ³ Diane Dutton and Sol Levine, Socioeconomic Status and Health, p.57 in *Pathways to Health*.
- ⁴ Alan Garber. Pursuing the links between socioeconomic factors and health. *Pathways to Health*. See Endnote 2.
- ⁵ Socioeconomic Inequalities in Health: Integrating Individual-, Community-, and Societal-level Theory and Research. S.A. Robert and James S. House. In *Handbook of Social Science in Health and Medicine*. (Eds.) G. Albrecht, R. Fitzpatrick, and S. Scrimshaw. Sage, 2000.
- ⁶ From the Comments of Barbara Starfield, in *Pathways to Health*.
- ⁷ See Lemon S, Zapka J, Puleo E, Luckmann R, Chasan-Taber L. Colorectal cancer screening participation: comparison with mammography and prostate-specific antigen screening; 2001. *AJPH*. Vol 91:1264-72. Also, Gornick et al Endnote 18.
- ⁸ Vital Statistics of the United States, 1994, preprint of Vol. II, Mortality. (Hyattsville, Md. NCHS, 1998.)
- ⁹ Measuring Social Class in US Public Health Research: Concepts, Methodologies, and Guidelines. N. Krieger, D.R. Williams, and N.E. Moss. *Annu. Rev. Public Health*, 1997. 18:341-78.
- ¹⁰ See p. 121 in the chapter by Robert and House (Endnote 3).
- ¹¹ Socioeconomic Status and Health in Industrialized Nations. (Eds.) Nancy E. Adler, Michael Marmot, Bruce McEwen, Judith Stewart. *Annals of the New York Academy of Sciences*. Vol.896,1999. New York, 1999.
- ¹² Krieger et al. Reference Endnote 9.
- ¹³ Reference, endnote 5.
- ¹⁴ Information from a paper on the web by Robert Pampalon and Guy Raymond. A Deprivation Index for Health and Welfare Planning in Quebec. *Chronic Diseases in Canada*. Volume 21, No.3-2000.
- ¹⁵ From personal participation in the Baltimore City Health Department study, in which a composite index was used to identify the most vulnerable census tracts as catchment areas for a federally-sponsored children and youth health care program.
- ¹⁶ Patricia O'Campo, presentation to the National Committee on Vital and Health Statistics, February 11, 2002, HHH Building, 200 Independence Ave., SW, Washington, D.C.
- ¹⁷ This issue is discussed in Fiscella K, Franks P, Gold MR, Clancy CM. Inequality in Quality: Addressing socioeconomic, racial, and ethnic disparities in health care. *JAMA*, May 17, 2000.
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²⁰ Aday LA, Fleming G, Andersen R.(1984) Access to Medical Care in the U.S.: Who has it, Who Doesn't? Chicago:Pluribus Press Inc. and the University of Chicago.

²¹ Envisioning the National Health Care Quality Report, (Eds. Margarita P. Hurtado, Elaine K. Swift, and Janet M. Corrigan. Institute of Medicine. National Academy Press. Washington, D.C.

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²⁴ For a fuller discussion of the Medicare experience, see (1) Vulnerable Populations and Medicare Services: Why do disparities exist? Marian E. Gornick. A Century Foundation Report. The Century Foundation Press. 2000.

²⁵ See endnote 18.

²⁶ Monitoring the Impact of Medicare Physician Payment Reform on Utilization and Access: 1994 report to Congress. Baltimore: Health Care Financing Administration, 1994 (HCFA Publication no. 03358); Monitoring the Impact of Medicare Physician Payment Reform on Utilization and Access: 1995 report to Congress. Baltimore: Health Care Financing Administration, 1995 (HCFA Publication no. 03378);

²⁷ Health United States, 2001. Table 90.

²⁸ In the early 1970s rising health care costs turned the attention of policymakers to cost containment. A large number of studies focused on geographic variations in the use of health care services. The case of Boston and New Haven was often cited: hospital admissions, surgery rates, and length of stay differ substantially even though both communities seemed to be similar in terms of age, race, and income levels. John Wennberg concluded that “geography is destiny: the care one receives depends in large part on the supply of resources available in the place where one lives – and on the practice patterns of local physicians.” See *The Dartmouth Atlas of Health Care*.John E. Wennberg, The American Hospital Association, 1996.

²⁹ See Fiscella K, et al. Endnote 17.