Influence of Patient Education on Profiles of Physician Practices

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Background: Few data are available about the effect of patient socioeconomic status on profiles of physician practices.

Objective: To determine the ways in which adjustment for patients' level of education (as a measure of socioeconomic status) changes profiles of physician practices.

Design: Cross-sectional survey of patients in physician practices.

Setting: Managed care organization in western New York State.

Participants: A random sample of 100 primary care physicians and 50 consecutive patients seen by each physician.

Measurements: Ranks of physicians for patient physical and mental health (Short Form 12-Item Health Survey) and satisfaction (Patient Satisfaction Questionnaire), adjusted for patient age, sex, morbidity, and education.

Results: Physicians whose patients had a lower mean level of education had significantly better ranks for patient physical and mental health status after adjustment for patients' level of education level than they did before adjustment ($P < 0.001$); this result was not seen for patient satisfaction. After adjustment for patients' level of education, each 1-year decrease in mean educational level was associated with a rank that improved by 8.1 (95% CI, 6.6 to 9.6) for patient physical health status and by 4.9 (CI, 3.9 to 5.9) for patient mental health status. Adjustment for education had similar effects for practices with more educated patients and those with less educated patients.

Conclusions: Profiles of physician practices that base ratings of physician performance on patients' physical and mental health status are substantially affected by patients' level of education. However, these results do not suggest that physicians who care for less educated patients provide worse care. Physician profiling should account for differences in patients' level of education.

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The widespread implementation of managed care in the United States has called attention to the quality of the health care delivered by health maintenance organizations (HMOs) and their participating providers (1). Quality indicators are often seen in HMO report cards (2–4) or physician profiles (5), which usually include a measure of patient satisfaction and a combination of process and outcome measures. Recently, interest has developed in using various health status measures to evaluate the performance of HMOs and providers (7, 8). For example, the Health Care Financing Administration's Health of Seniors program has begun to use the Medical Outcomes Study Short Form 36-Item Health Survey (SF-36) to assess changes in the physical and mental health status of elderly patients enrolled in HMOs across the United States (9).

However, performance reports and profiles are not usually adjusted for patients' level of education (10). Because patients' education level often differs by both physical and mental health status (11–16) and by provider, it may confound providers' health outcome profiles. Level of education may also be associated with patient satisfaction (17) and may similarly confound performance measures of this variable. Consequently, practice profiles of physicians who care for poorer patients may reflect lower mean health status and satisfaction simply because of patients' demographic characteristics. In other words, current performance measures may unfairly penalize providers who care for poorer patients.

In contrast to case-mix adjustment, limited empirical data are available about the effect of patients' education level on performance profiles (18). We evaluated the effect of patients' education level on the rank of physician practices, which was determined by three performance measures: patient physical health status, patient mental health status, and patient satisfaction.

Methods

Physician Sample

We analyzed data taken from a study of the referral behavior of primary care physicians (19). As part of the original study, 100 primary care physicians (internists and family physicians) were randomly selected for participation if they had been practicing for at least 2 years before the office survey, had at least 100 patients enrolled in the largest local managed care organization (which enrolls more than 50% of the local population) during both of those years, and reported no area of specialization that prompted referrals from other physicians. Of the 457 primary care physicians practicing in the metropolitan Rochester, New York, area, 274 met these criteria. All eligible physicians who agreed to participate in an office survey and respond to a questionnaire were enrolled, and 182 (66%) agreed to participate. To reach previously determined power requirements, we selected a subsample of eligible physicians by using random numbers for the office survey component of the study.

Profiles of Physician Practices

Physicians were ranked on the basis of mean patient physical and mental health status scores and patient satisfaction scores; these scores were derived from patient surveys conducted in the physicians' offices. All ranks were adjusted for age, sex, case mix, and insurance status. We examined the effect of additional adjustment for patients' education level on ranks.

Patient Selection and Survey

Research assistants distributed self-administered surveys to at least 50 consecutive patients 30 years of age or older who visited the offices of each of the participating physicians. Patients who could not complete the questionnaire by themselves were given assistance. In addition to completing health status, patient satisfaction, and morbidity instruments, patients were asked to provide their age, sex, and level of education.

Patient Health Status

Patient physical and mental health status were assessed by using the Short Form 12-Item Health Survey (SF-12), a self-report instrument that allows construction of a physical component summary (PCS) and a mental component summary (MCS) (20). Scores for each component ranged from 0 to 100; higher scores indicated better health. All items were derived from the SF-36 to reproduce the PCS and MCS scores of this instrument in a U.S. population sample (20). For predicting the SF-36 PCS and MCS scores, initial studies showed that the regression coefficient was 0.91 for the physical health component subscale and 0.92 for the mental health component subscale. Test–retest reliabilities of the two scales were 0.89 and 0.76, respectively (20). Several subsequent studies conducted in national and international samples, including samples similar to ours, have confirmed the reliability and validity of the SF-12 (20–23).

Patient Satisfaction

Patients completed the general satisfaction subscale from the Patient Satisfaction Questionnaire (24). Higher scores indicated greater satisfaction (range, 1 to 5). Nunnally and Bernstein (25) suggested that an internal scale consistency greater than 0.8 provides a satisfactory level of reliability for research purposes. In our study, the internal consistency (measured by using the Cronbach α value) was 0.84 (95% CI, 0.83 to 0.85).

Case-Mix Adjustment

We used the method described by Katz and colleagues (26) to assess patient morbidity from a checklist of chronic diseases and their treatments. Among hospitalized patients older than 50 years of age, patient-generated indexes were found to be reliable and valid compared with chart review and were equally predictive of resource utilization (26). We used self-reported years of education as a measure of socioeconomic position.

Statistical Analysis

Three sets of mixed-effects regression analyses were fitted (27), one for each of the three performance outcomes (physical health status, mental health status, and satisfaction). Because these outcomes were approximately normally distributed, the models were fitted with an identity link and a Gaussian error structure. To account for the natural correlation of patients in a particular physician's practice, the models assumed a compound symmetric (exchangeable) correlation structure. These models estimated the variation in patient outcomes by physician (random effect) after adjusting for patient characteristics (fixed effects). Patient factors included age, sex, insurance status, clinical condition (case mix), and education. An interaction term for education level of an individual patient and a term for the mean education level of all patients in the practice were also included as a fixed effect.

Ranks of physician practices for each outcome were determined from the estimates of variables for the physician random effects. Practices with the largest positive random-effects estimates, which represented the largest positive departure from the average of the 100 practices, were ranked the highest. Those with the largest negative random-effects estimates were ranked the lowest. These mixed-effects, or hierarchical, models adjust for the clustering induced by the nesting of patients within practices and also tend to produce better, more stable estimates of relative performance (profiling) by shrinking all of the physician-specific estimates toward the overall mean (28–30). By including or deleting patients' education level from the models and then examining the changes in ranks, we tested the effect of education on observed physician performance. By including an interaction term between the education level of individual patients and the mean education level of all patients in the practice, we examined the differences in the effect of adjusting for education between practices whose patients had a higher mean education level and those whose patients had a lower mean education level. All analyses were conducted by using the MIXED procedure (SAS, version 6.12, SAS Institute, Inc., Cary, North Carolina).

Role of the Funding Source

The original study protocol was approved by the institutional review board at the University of Rochester and was supported by a grant from the Agency for Health Care Policy and Research. The funding source had no role in the design, conduct, or reporting of the study.

Results

The mean physician age was 46.6 years. Eighteen percent of physicians were women, and 66% were internists. Compared with the 357 local primary care physicians who did not participate in the office survey, those who participated had more patients who were enrolled in the largest local managed care organization (mean, 586 patients compared with 421 patients; $P < 0.001$); participating physicians also generated lower costs per patient per year in that organization ($1091 compared with $1422; $P = 0.02$). No statistically significant differences were seen in mean physician age (47 years compared with 48 years), sex (82% men compared with 79% men), number of practice partners (3.4 for both), or average age of patients in the managed care organization (45 years for both).

Of patients who were approached to participate in the study, 98% (n = 5155) agreed to enroll. The mean (± SD) PCS score was 44.5 ± 11.5, the MCS score was 49.1 ± 10.7, and the mean satisfaction score was 4.02 ± 0.39; all of these variables were approximately normally distributed. **Table 1** shows the average mean (± SD) and range of patient characteristics for the approximately 50 patients sampled in each practice.

The change in physician rank associated with adjustment for education is shown in **Table 2**. Ranks ranged from 1 to 100; 1 represents the best rank. For the outcome of physical health status, the rank of 18 physicians changed by 10 or more; for the outcome of mental health status, the rank of 11 physicians changed by 10 or more; and for the outcome of satisfaction, the rank of 2 physicians changed by 10 or more. These effects are reflected in the regression analyses, in which education had the largest effect on the analysis of physical health status ($F = 10.6$; $P < 0.001$), a more modest effect on the analysis of mental health status ($F = 4.4$; $P < 0.001$), and the smallest effect on the analysis of satisfaction ($F = 2.4$; $P = 0.01$).

The relation between the mean level of patient education and the effects of adjustment for education on physician ranks are shown in **Figures 1** ($r = 0.73$ for physical health status) and **2** ($r = 0.62$ for mental health status). When the mean education level was regressed on the change in physician rank produced by adjusting for education, each 1-year decrease in mean education level was associated with a rank that improved by 8.1 (CI, 6.6 to 9.6) for

Table 1. Patient Characteristics by Practice (n = 100)*

Characteristic	Mean Value ± SD (Minimum, Maximum)
Patient variables	
Physical health status score†	44.55 ± 2.31 (38.40, 49.60)
Mental health status score†	49.12 ± 2.20 (43.58, 53.49)
Satisfaction score	4.02 ± 0.08 (3.76, 4.18)
Age, *y*	56.33 ± 4.72 (46.79, 68.47)
Female, %	58 ± 0.12 (33, 88)
Black, %	7 ± 0.10 (0, 72)
Education, *y*	13.42 ± 0.69 (12.01, 15.43)
Private HMO, %	70 ± 0.14 (4, 94)
Private non-HMO, %	6 ± 0.06 (0, 37)
Medicaid, %	2 ± 0.05 (0, 20)
Medicare, %	13 ± 0.09 (0, 38)
Patients reporting clinical conditions, %	
Angina	6 ± 0.04 (0, 18)
Asthma	11 ± 0.05 (2, 26)
Diabetes	12 ± 0.06 (0, 27)
Arthritis	17 ± 0.07 (4, 37)
Stroke	0.5 ± 0.04 (0, 17)
Peptic ulcer	06 ± 0.04 (0, 20)
Depression	19 ± 0.08 (4, 44)
Hypertension	36 ± 0.11 (10, 63)
Heart attack	3 ± 0.02 (0, 10)
Colitis	3 ± 0.03 (0, 12)
Thyroid disease	8 ± 0.04 (0, 25)
Cancer	4 ± 0.03 (0, 14)
Kidney disease	2 ± 0.02 (0, 9)

* HMO = health maintenance organization.
† Component summary scores from the Short Form 12-Item Health Survey.

Table 2. Effect of Adjustment for Patient Education on Ranks of Physician Performance

Performance Measure	Mean Change in Physician Rank	Physicians with a Change of 0–4	Physicians with a Change of 5–9	Physicians with a Change of 10–19	Physicians with a Change ≥20
	←		%		→
Patient mental health status	4.3	56	33	11	–
Patient physical health status	5.4	60	22	15	3
Patient satisfaction	2.0	91	7	2	–

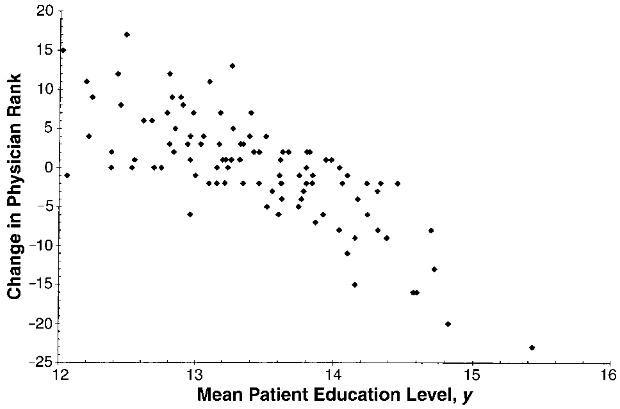

Figure 1. Relation between mean education level of patients and effect of adjustment for patient education on physician rank for patient physical health status.

patient physical health status and by 4.9 (CI, 3.9 to 5.9) for patient mental health status ($P < 0.001$ overall). No statistically significant relation was seen between mean level of patient education and change in rank for satisfaction (rank improvement, 0.2 [CI, −0.5 to 1.0]) ($P > 0.2$).

A final set of analyses examined whether a relation existed between the mean level of patient education and adjustment for education on the three outcomes. There was no evidence of a statistically significant interaction between the education level of individual patients and the mean education level of all patients in the practice for physical health status ($F = 0.87$; $P > 0.2$), mental health status ($F = 1.4$; $P = 0.18$), or satisfaction ($F = 1.4$; $P = 0.16$). Therefore, there is no statistical evidence that the effects of adjustment for education differ between practices whose patients have a higher mean education level and those whose patients have a lower mean education level.

Discussion

Our findings demonstrate significant relations between patient socioeconomic position measured by education level and physician ranks for patient physical and mental health status. A higher level of patient education was associated with greater satisfaction, although the association was weak and the effect on rank was small. These effects were similar in practices whose patients had a higher mean education level and those whose patients had a lower mean education level. Previous studies have emphasized the need to use case-mix adjustment in physician profiles (31–34). Our findings suggest that adjustment for age, sex, and case mix only may not be sufficient.

Although education affected each of the three performance measures, the effects were much greater for health status than for satisfaction. These findings, which parallel the well-established relation between socioeconomic position and health status (11, 13, 35) and the more tenuous relation between socioeconomic position and satisfaction (17, 36, 37), challenge the validity of physician profiling that does not control for patients' socioeconomic position. Profiles that do not adjust for socioeconomic position may underestimate the performance of providers who care for socioeconomically disadvantaged patients and overestimate the performance of those who care for socioeconomically advantaged patients. This bias in profiling may encourage selective enrollment of socioeconomically advantaged patients to improve performance ratings.

Our study had several limitations. First, our findings were based on a sample of 100 primary care physician practices in the metropolitan Rochester, New York, area. It is possible that surveyed patients differed from nonsurveyed patients in terms of health status (sicker patients may make more visits) and satisfaction (sicker patients may have lower levels of satisfaction [38]). Furthermore, in the United States, patients in a lower socioeconomic position use health care resources less frequently than those in a higher socioeconomic position (39–41) and are likely to be under-represented in an office-based sample. Consequently, our results may underestimate the effect of education on profiles of physician practices. Findings from this group of physicians and their patients may not be generalizable to other samples in the United States. However, given the magnitude of the associations demonstrated between the profile measures and the education level of patients in a practice and the well-documented association between socioeconomic position and health status (11, 14, 42), it would be surprising if similar findings were not observed in other settings.

Second, we examined only three performance measures. We did not examine the possible effects

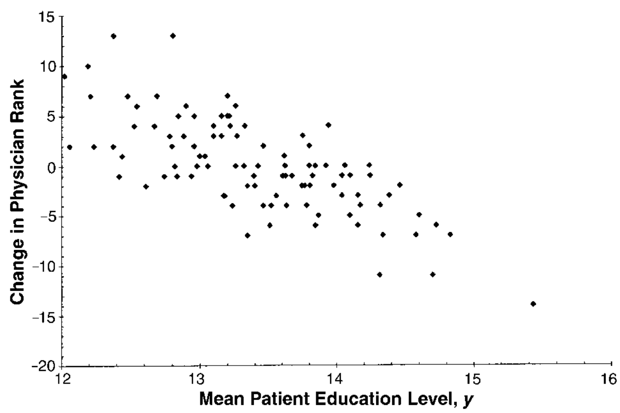

Figure 2. Relation between mean education level of patients and effect of adjustment for patient education on physician rank for patient mental health status.

of socioeconomic adjustment on use of health care resources, process of care, costs, or compliance with clinical preventive services. However, given the relation between socioeconomic position and health (11, 13, 35), avoidable hospitalizations (43, 44), hospital readmission (45), and visits for preventive health (46, 47), these outcomes are probably also confounded by socioeconomic position. Preliminary data suggest that adjustment for patient socioeconomic position affects some Health Plan Employer Data Information Set measures and adjusted inpatient costs (48, 49). Therefore, our findings may apply to performance measures that were not examined in this study.

Third, it is possible that alternate case-mix adjustment would have produced different results. We used the comorbidity questionnaire, which was developed by Katz and colleagues (26) and has been validated among hospitalized patients but not among primary care patients. Typical claims-driven case-mix adjustment uses such methods as the Ambulatory Care Group system (34, 50, 51), which examines the effect of combined categories of outpatient physician–generated diagnoses on expenditures. Such methods provide little additional information about disease severity, and both the prevalence and severity of disease are related to socioeconomic position (12, 52–54). Because claims-based case-mix adjustment is susceptible to diagnostic upcoding (55–57), standardized methods of collecting socioeconomic information would probably be more resistant to this problem.

Fourth, we used education as the only measure of socioeconomic position. Previous studies have demonstrated independent effects of education, income, and occupation on health indicators (11, 12, 14, 58). Therefore, we may have underestimated the effects of socioeconomic adjustment. However, the collection of additional information on topics other than education might be viewed as burdensome and intrusive. Because patient addresses are already part of claims data, census-derived socioeconomic data obtained by geocoding patient addresses may provide a feasible, computer-based alternative to excessive patient questioning (59, 60).

Finally, we cannot exclude socioeconomic bias in the provision of health care as an explanation for our findings (61). In one study, low-income persons reported receiving less diet and exercise counseling than high-income persons (62). In addition, ethnicity-based disparities in receipt of technological procedures have been well documented (63–68). However, other studies have shown little or no difference in the provision of routine medical care—particularly clinical preventive services (47, 69)—according to socioeconomic position (61, 69, 70). Therefore, we believe that socioeconomic bias in care is an unlikely explanation for our findings.

One concern about adjustment profiles for patient socioeconomic position is the possibility that physicians who care for disadvantaged patients deliver inferior care (18). If this were true, adjusting for socioeconomic factors could be viewed as overadjustment. However, existing data, though limited, tend to refute this suggestion. Starfield and coworkers (71) found that physicians in community health centers provided better care (as measured by several process-of-care indicators) than physicians practicing in private offices. We found no evidence of an interaction between mean education level of all patients in a practice and individual patient education, which suggests that the effect of adjusting for education does not differ between practices whose patients have a higher mean education level and those whose patients have a lower mean education level. Therefore, little evidence supports the notion that adjustment for socioeconomic factors represents overadjustment, at least among the physicians in our study.

Routine adjustment of physician profiles or HMO report cards for patient socioeconomic status is clearly controversial (18). The goal of promoting equity in the evaluation of performance seems to conflict with the goal of promoting equity in the provision of health care regardless of socioeconomic position. Such adjustment may mask the provision of inferior care to poor patients. One solution to this problem would be to compile both practice- or population-wide performance reports that are adjusted for socioeconomic position and performance reports that are broken down according to several socioeconomic categories. For example, rates of influenza immunizations for elderly persons in HMOs could be reported as a fully adjusted population-wide rate and as rates stratified by years of patient education. This approach would allow consumers, purchasers, and accrediting agencies to evaluate physicians' overall performance and their performance with specific groups at risk for suboptimal care. Rather than obscuring inferior care provided to groups at risk, this approach highlights the quality of care provided to such groups. These effects may easily be lost with existing performance assessment methods, particularly when vulnerable groups are in the minority in the sample under evaluation.

Our findings demonstrate the effects of adjustment for patients' education level on three measures of physician performance, in addition to the effects observed with case-mix adjustment. Physician profiles that do not control for the socioeconomic characteristics of patients penalize physicians who care for disadvantaged patients. No evidence suggests that socioeconomic adjustment of profiles represents overadjustment; therefore, we recommend that physician profiles be adjusted for patient socioeconomic status. The optimal strategy to accomplish this goal has not yet been determined.

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References

1. **Brook RH, McGlynn EA, Cleary PD.** Quality of health care. Part 2: measuring quality of care [Editorial]. N Engl J Med. 1996;335:966-70.
2. **Epstein AM.** Rolling down the runway: the challenges ahead for quality report cards. JAMA. 1998;279:1691-6.
3. **Shapiro DW, Lasker RD, Bindman AB, Lee PR.** Containing costs while improving quality of care: the role of profiling and practice guidelines. Annu Rev Public Health. 1993;14:219-41.
4. **Spoeri RK, Ullman R.** Measuring and reporting managed care performance: lessons learned and new initiatives. Ann Intern Med. 1997;127(8 Pt 2):726-32.
5. **McNeil BJ, Pedersen SH, Gatsonis C.** Current issues in profiling quality of care. Inquiry. 1992;29:298-307.
6. **Clancy CM, Eisenberg JM.** Outcomes research: measuring the end results of health care. Science. 1998;282:245-6.
7. **Lohr KN.** Applications of health status assessment measures in clinical practice. Overview of the third conference on advances in health status assessment. Med Care. 1992;30(5 Suppl):MS1-14.
8. **Patrick DL.** Finding health-related quality of life outcomes sensitive to health-care organization and delivery. Med Care. 1997;35(11 Suppl):NS49-57.
9. **Cooper JK.** Measuring the health of seniors [Editorial]. Arch Fam Med. 1998; 7:415-6.
10. **Selby JV.** Linking automated databases for research in managed care settings. Ann Intern Med. 1997;127(8 Pt 2):719-24.
11. **Sorlie PD, Backlund E, Keller JB.** US mortality by economic, demographic, and social characteristics: the National Longitudinal Mortality Study. Am J Public Health. 1995;85:949-56.
12. **Marmot MG, Smith GD, Stansfeld S, Patel C, North F, Head J, et al.** Health inequalities among British civil servants: the Whitehall II study. Lancet. 1991;337:1387-93.
13. **Hemingway H, Nicholson A, Stafford M, Roberts R, Marmot M.** The impact of socioeconomic status on health functioning as assessed by the SF-36 questionnaire: the Whitehall II Study. Am J Public Health. 1997;87: 1484-90.
14. **Lantz PM, House JS, Lepkowski JM, Williams DR, Mero RP, Chen J.** Socioeconomic factors, health behaviors, and mortality: results from a nationally representative prospective study of US adults. JAMA. 1998;279:1703-8.
15. **Fiscella K, Franks P.** Does psychological distress contribute to racial and socioeconomic disparities in mortality? Soc Sci Med. 1997;45:1805-9.
16. **Fiscella K.** Is lower income associated with greater biopsychosocial morbidity? Implications for physicians working with underserved patients. J Fam Pract. 1999;48:372-7.
17. **Harpole LH, Orav EJ, Hickey M, Posther KE, Brennan TA.** Patient satisfaction in the ambulatory setting. Influence of data collection methods and sociodemographic factors. J Gen Intern Med. 1996;11:431-4.
18. **Blustein J, Hanson K, Shea S.** Preventable hospitalizations and socioeconomic status. Health Aff (Millwood). 1998;17:177-89.
19. **Franks P, Zwanziger J, Mooney C, Sorbero M.** Variations in primary care physician referral rates. Health Serv Res. 1999;34(1 Pt 2):323-9.
20. **Ware JE Jr, Kosinski M, Keller SD.** A 12-item short-form health survey. Construction of scales and preliminary tests of reliability and validity. Med Care. 1996;34:220-33.
21. **Jenkinson C, Layte R, Jenkinson D, Lawrence K, Petersen S, Paice C, et al.** A shorter form health survey: can the SF-12 replicate results from the SF-36 in longitudinal studies? J Public Health Med. 1997;19:179-86.
22. **Johnson JA, Coons SJ.** Comparison of the EQ-5D and SF-12 in an adult US sample. Qual Life Res. 1998;7:155-66.
23. **Gandek B, Ware JE, Aaronson NK, Apolone G, Bjorner JB, Brazier JE, et al.** Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. International Quality of Life Assessment. J Clin Epidemiol. 1998;51:1171-8.
24. **Ware JE Jr, Snyder MK, Wright WR, Davies AR.** Defining and measuring patient satisfaction with medical care. Eval Program Plann. 1983;6:247-63.
25. **Nunnally JC, Bernstein IH.** Anonymous Psychometric Theory. 3d ed. New York: McGraw-Hill; 1994.
26. **Katz JN, Chang LC, Sangha O, Fossel AH, Bates DW.** Can comorbidity be measured by questionnaire rather than medical record review? Med Care. 1996;34:73-84.
27. **Zeger SL, Liang KY.** An overview of methods for the analysis of longitudinal data. Stat Med. 1992;11:1825-39.
28. **Christiansen CL, Morris CN.** Improving the statistical approach to health care provider profiling. Ann Intern Med. 1997;127(8 Pt 2):764-8.
29. **Normand ST, Glickman ME, Gatsonis CA.** Statistical methods for profiling providers of medical care: issues and applications. Journal of the American Statistical Association. 1997;92:803-14.
30. **Goldstein H, Spiegelhalter DJ.** League tables and their limitations: statistical issues in comparisons of institutional performance. Journal of the Royal Statistical Society. 1996;159:385-443.
31. **Chang W, McCracken SB.** Applying case mix adjustment in profiling primary care physician performance. J Health Care Finance. 1996;22:1-9.
32. **Salem-Schatz S, Moore G, Rucker M, Pearson SD.** The case for case-mix adjustment in practice profiling. When good apples look bad. JAMA. 1994; 272:871-4.
33. **Powe NR, Weiner JP, Starfield B, Stuart M, Baker A, Steinwachs DM.** Systemwide provider performance in a Medicaid program. Profiling the care of patients with chronic illnesses. Med Care. 1996;34:798-810.
34. **Fowles JB, Weiner JP, Knutson D, Fowler E, Tucker AM, Ireland M.** Taking health status into account when setting capitation rates: a comparison of risk-adjustment methods. JAMA. 1996;276:1316-21.
35. **Fein O.** The influence of social class on health status: American and British research on health inequalities. J Gen Intern Med. 1995;10:577-86.
36. **Schmittdiel J, Selby JV, Grumbach K, Quesenberry CP Jr.** Choice of a personal physician and patient satisfaction in a health maintenance organization. JAMA. 1997;278:1596-9.
37. **Hall JA, Dornan MC.** Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis. Soc Sci Med. 1990;30: 811-8.
38. **Hall JA, Milburn MA, Epstein AM.** A causal model of health status and satisfaction with medical care. Med Care. 1993;31:84-94.
39. **Fiscella K, Franks P, Clancy CM.** Skepticism toward medical care and health care utilization. Med Care. 1998;36:180-9.
40. **Newacheck PW, Hughes DC, Stoddard JJ.** Children's access to primary care: differences by race, income, and insurance status. Pediatrics. 1996;97: 26-32.
41. **Wood DL, Hayward RA, Corey CR, Freeman HE, Shapiro MF.** Access to medical care for children and adolescents in the United States. Pediatrics. 1990;86:666-73.
42. **Hemingway H, Stafford M, Stansfeld S, Shipley M, Marmot M.** Is the SF-36 a valid measure of change in population health? Results from the Whitehall II Study. BMJ. 1997;315:1273-9.
43. **Weissman JS, Gatsonis C, Epstein AM.** Rates of avoidable hospitalization by insurance status in Massachusetts and Maryland. JAMA. 1992;268:2388-94.
44. **Bindman AB, Grumbach K, Osmond D, Komaromy M, Vranizan K, Lurie N, et al.** Preventable hospitalizations and access to health care. JAMA. 1995;274:305-11.
45. **Weissman JS, Stern RS, Epstein AM.** The impact of patient socioeconomic status and other social factors on readmission: a prospective study in four Massachusetts hospitals. Inquiry. 1994;31:163-72.
46. **Calle EE, Flanders WD, Thun MJ, Martin LM.** Demographic predictors of mammography and Pap smear screening in US women. Am J Public Health. 1993;83:53-60.
47. **Solberg LI, Brekke ML, Kottke TE.** Are physicians less likely to recommend preventive services to low-SES patients? Prev Med. 1997;26:350-7.
48. **Zaslavsky AM, Hochheimer JN, Schneider EC, Cleary PD, Seidman JJ, McGlynn EA, et al.** Impact of sociodemographic case-mix on the HEDIS measures of health plan quality [Abstract]. Association for Health Services Research 16th Annual Meeting. Washington, DC: Association for Health Services Research; 1999;327-8.
49. **Pickens G, Bankowitz R, Bouman P.** Can we measure the impact of social and economic status on risk-adjusted costs of inpatient care? [Abstract] Association for Health Services Research 16th Annual Meeting. Washington, DC: Association for Health Services Research; 1999;388-9.
50. **Weiner JP, Starfield BH, Steinwachs DM, Mumford LM.** Development and application of a population-oriented measure of ambulatory care case-mix. Med Care. 1991;29:452-72.
51. **Starfield B, Weiner J, Mumford L, Steinwachs D.** Ambulatory care groups: a categorization of diagnoses for research and management. Health Serv Res. 1991;26:53-74.
52. **Lynch JW, Kaplan GA, Cohen RD, Tuomilehto J, Salonen JT.** Do cardiovascular risk factors explain the relation between socioeconomic status, risk of all-cause mortality, cardiovascular mortality, and acute myocardial infarction? Am J Epidemiol. 1996;144:934-42.
53. **Vliet Vlieland TP, Buitenhuis NA, van Zeben D, Vandenbroucke JP, Breedveld FC, Hazes JM.** Sociodemographic factors and the outcome of rheumatoid arthritis in young women. Ann Rheum Dis. 1994;53:803-6.
54. **Persky VW, Slezak J, Contreras A, Becker L, Hernandez E, Ramakrishnan V, et al.** Relationships of race and socioeconomic status with prevalence, severity, and symptoms of asthma in Chicago school children. Ann Allergy Asthma Immunol. 1998;81:266-71.
55. **Hsia DC, Ahern CA, Ritchie BP, Moscoe LM, Krushat WM.** Medicare reimbursement accuracy under the prospective payment system, 1985 to

1988. JAMA. 1992;268:896-9.
56. **Welch HG, Black WC, Fisher ES.** Case-mix adjustment: making bad apples look good [Letter]. JAMA. 1995;273:772-3.
57. **Green J, Wintfeld N.** Report cards on cardiac surgeons. Assessing New York State's approach. N Engl J Med. 1995;332:1229-32.
58. **Davey Smith G, Hart C, Hole D, MacKinnon P, Gillis C, Watt G, et al.** Education and occupational social class: which is the more important indicator of mortality risk? J Epidemiol Community Health. 1998;52:153-60.
59. **Krieger N.** Overcoming the absence of socioeconomic data in medical records: validation and application of a census-based methodology. Am J Public Health. 1992;82:703-10.
60. **Geronimus AT, Bound J.** Use of census-based aggregate variables to proxy for socioeconomic group: evidence from national samples. Am J Epidemiol. 1998;148:475-86.
61. **Scott A, Shiell A, King M.** Is general practitioner decision making associated with patient socio-economic status? Soc Sci Med. 1996;42:35-46.
62. **Taira DA, Safran DG, Seto TB, Rogers WH, Tarlov AR.** The relationship between patient income and physician discussion of health risk behaviors. JAMA. 1997;278:1412-7.
63. **Ayanian JZ, Udvarhelyi IS, Gatsonis CA, Pashos CL, Epstein AM.** Racial differences in the use of revascularization procedures after coronary angiography. JAMA. 1993;269:2642-6.
64. **Ferguson JA, Tierney WM, Westmoreland GR, Mamlin LA, Segar DS, Eckert GJ, et al.** Examination of racial differences in management of cardiovascular disease. J Am Coll Cardiol. 1997;30:1707-13.
65. **Peterson ED, Wright SM, Daley J, Thibault GE.** Racial variation in cardiac procedure use and survival following acute myocardial infarction in the Department of Veterans Affairs. JAMA. 1994;271:1175-80.
66. **Goldberg KC, Hartz AJ, Jacobsen SJ, Krakauer H, Rimm AA.** Racial and community factors influencing coronary artery bypass graft surgery rates for all 1986 Medicare patients. JAMA. 1992;267:1473-7.
67. **Peterson ED, Shaw LK, DeLong ER, Pryor DB, Califf RM, Mark DB.** Racial variation in the use of coronary-revascularization procedures. Are the differences real? Do they matter? N Engl J Med. 1997;336:480-6.
68. **Schulman KA, Berlin JA, Harless W, Kerner JF, Sistrunk S, Gersh BJ, et al.** The effect of race and sex on physicians' recommendations for cardiac catheterization. N Engl J Med. 1999;340:618-26.
69. **Kikano GE, Schiaffino MA, Zyzanski SJ.** Medical decision making and perceived socioeconomic class. Arch Fam Med. 1996;5:267-70.
70. **Epstein AM, McNeil BJ.** The effects of patient characteristics on ambulatory test ordering. Soc Sci Med. 1985;21:1071-5.
71. **Starfield B, Powe NR, Weiner JR, Stuart M, Steinwachs D, Scholle SH, et al.** Costs vs quality in different types of primary care settings. JAMA. 1994;272:1903-8.

I anyhow was impressed myself with the weight and the tenor of the moment, distilled even from it straightaway a manner of illumination, comprehended in an instant how fragile in fact this life can be, not because an organ might flutter and fail or blood might be loosed to flow, but largely because we rarely know when the ground is hollow beneath us until after it's already crumbled and once it's given way.

T.R. Pearson
Cry Me a River
New York: Henry Holt & Co; 1993:152

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