

Physician Career Satisfaction Across Specialties

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Background: The career satisfaction and dissatisfaction physicians experience likely influence the quality of medical care.

Objective: To compare career satisfaction across specialties among US physicians.

Methods: We analyzed data from the Community Tracking Study of 12 474 physicians (response rate, 65%) for the late 1990s. Data are cross-sectional. Two satisfaction variables were created: very satisfied and dissatisfied. Thirty-three specialty categories were analyzed.

Results: After adjusting for control variables, the following specialties are significantly more likely than family medicine to be very satisfying: geriatric internal medicine (odds ratio [OR], 2.04); neonatal-perinatal medicine (OR, 1.89); dermatology (OR, 1.48); and pediatrics (OR, 1.36). The following are significantly more likely than

family medicine to be dissatisfying: otolaryngology (OR, 1.78); obstetrics-gynecology (OR, 1.61); ophthalmology (OR, 1.51); orthopedics (OR, 1.36); and internal medicine (OR, 1.22). Among the control variables, we also found nonlinear relations between age and satisfaction; high satisfaction among physicians in the west north Central and New England states and high dissatisfaction in the south Atlantic, west south Central, Mountain, and Pacific states; positive associations between income and satisfaction; and no differences between women and men.

Conclusions: Career satisfaction and dissatisfaction vary across specialty as well as age, income, and region. These variations are likely to be of interest to residency directors, managed care administrators, students selecting a specialty, and physicians in the groups with high satisfaction and dissatisfaction.

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PHYSICIAN CAREER satisfaction and morale has received great attention recently.¹⁻⁸ There are reasons for this attention. First, physicians who are satisfied with their careers are likely to provide better health care than dissatisfied physicians. Physician satisfaction has been found to strongly correlate with patient satisfaction.⁷ Second, high physician satisfaction is also likely to result from good outcomes with patients.⁸ Satisfaction, therefore, may be an indirect measure of patient outcomes.

Dissatisfaction is also of concern. First, an important factor in maintaining a high quality of medical care for all Americans at low cost is achieving a balance in the specialty mix of physicians.⁹ Current dissatisfaction may forecast future declines in numbers of practitioners within a specialty. Second, dissatisfaction, if prolonged, may result in health problems for the physicians themselves.¹⁰ Third, dissatisfied physicians may be more inclined to unionize¹¹ and strike.¹²

There are several possible sources of variation in physician satisfaction. Studies have looked at demographic factors. McMur-

ray et al¹ found that women had a 60% greater chance than men of reporting "burnout." Frank et al² found that women physicians were generally satisfied with their careers. Haas et al³ found that younger physicians had lower satisfaction than middle-aged physicians. Another line of research has addressed whether managed care has resulted in a decline in physician career satisfaction.⁴⁻⁶ Finally, a number of studies have addressed satisfaction within specific specialties: emergency medicine,¹³ general internal medicine,³ dermatology,¹⁴ obstetrics-gynecology,¹⁵ family medicine,¹⁶ psychiatry,¹⁷ and geriatrics.¹⁸ To our knowledge, however, no study has focused exclusively on comparing the level of satisfaction across many specialties. Our study may be useful to directors of residency training programs and managed care administrators¹⁹ as well as to medical students choosing a specialty or physicians leaving a specialty. Finally, other factors may operate in conjunction with specialty to influence satisfaction. These factors—including age, educational background, and practice settings—may be of considerable interest in their own right.

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METHODS

DATA

Data were drawn from the Community Tracking Physician Survey (CTS) for 1996-1997. The survey was given to a representative sample of physicians not employed by the federal government, who reside in the continental United States and who provide direct patient care at least 20 hours per week. The survey followed a complex design with 60 sites and a small independently drawn national sample.²⁰ Some specialists such as radiologists, anesthesiologists, and pathologists as well as all residents and fellows were excluded from the sample. Primary care physicians were oversampled. Physicians were randomly selected within sites as well as physician strata.²⁰ The overall response rate was 65%. Response rates by physician specialty were not available. However, the CTS data gatherers maintain that the data are representative of the physicians within the nation.²⁰ Moreover, to enhance the integrity of our findings, we analyzed only specialties for which we had data on at least 40 physicians.

The CTS had data on 12528 physicians. However, 25 physicians did not have useful answers for the satisfaction question, and 29 physicians had missing data on 1 or more of the control variables. Our sample size, therefore, was 12474.

DEPENDENT VARIABLES

Two dependent variables indicated whether the physician is very satisfied or dissatisfied. They were both created from answers to the following question: "Thinking very generally about your satisfaction with your overall career in medicine, would you say that you are currently very satisfied (n=5273), somewhat satisfied (n=4794), somewhat dissatisfied (n=1677), very dissatisfied (n=518), neither satisfied nor dissatisfied (n=212), don't know (n=16), refuse to answer (n=9)?" If the physician responded "very satisfied," then our very satisfied variable equaled 1; our very satisfied variable equaled 0 for all other responses. The dissatisfied variable combined responses in the "somewhat dissatisfied" (n=1679) with the "very dissatisfied" (n=519) categories. Our very satisfied and dissatisfied variables were intended to capture the extremes. We did not classify "somewhat satisfied" or "neither satisfied nor dissatisfied" at either extreme. Persons responding "don't know" or "refuse to answer" were excluded.

CONTROL VARIABLES

Control variables were not arbitrarily selected. We used the most popular control variables identified in the literature that,

in turn, rely on the Eisenberg model.^{21,22} These are most usefully classified as physician characteristics, experience with managed care, community factors, and type of practice.

Physician characteristics included age, sex, whether board certified, and whether a graduate of foreign medical school. The physician's "experience with managed care" was captured by the variable "percentage of revenue from managed care." One community factor was whether the physician resides in a town or area with a population less than 200 000 (roughly 8.6% of our sample resided in these towns and areas). We intended for this variable to capture the "rural and small town" effect. Other community factors included 9 regions of the country: New England (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut); mid Atlantic (New York, New Jersey, and Pennsylvania); east north Central (Ohio, Indiana, Illinois, Michigan, and Wisconsin); west north Central (Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas); south Atlantic (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida); east south Central (Kentucky, Tennessee, Alabama, and Mississippi); west south Central (Arkansas, Louisiana, Oklahoma, and Texas); Mountain (Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, and Nevada); and Pacific (Washington, Oregon, California, Alaska, and Hawaii).

Considerable information on type of practice was available in the CTS. Annual income was included in the following broad categories: under \$50 000; \$50 000 to \$99 999; \$100 000 to \$149 999; \$150 000 to \$199 999; \$200 000 to \$249 999; \$250 000 to \$299 999; and over \$300 000. Information was also available on ownership of practice. We created 2 variables: whether the physician is full owner (sole proprietor) or part owner (partner). Finally, we also considered average weekly work hours as a control variable. Specialties are classified in 33 categories (**Table 1**).

STATISTICS

In our univariate analysis, we performed χ^2 tests. Sample weights and geographic design effects are accounted for with STATA 6.0²³ programs. In our multivariate analysis, which we believe to be a more credible analysis, control variables were accounted for in logistic regressions that adjusted for geographic clusters using svylogit in STATA 6.0.²³ Family practice was chosen as the comparison category in the multivariate analysis for 2 reasons. First, it contained the most incumbents of any specialty in the CTS. Second, the percentages for very satisfied and dissatisfied (43% and 17%, respectively) were very close to the mean for all specialties (42% and 18%, respectively).

RESULTS

Table 1 presents cross-tabulations for the control variables and specialties, on the one hand, with dependent variables—very satisfied and dissatisfied—on the other. The mean age is 48 years. Roughly, 79% of the sample are board certified, 20% are graduates of foreign medical schools, and 20% are women. The income category with the highest percentage is \$100 000 to \$149 999. Roughly, 35% are full owners of their practices; 23% are part owners. These physicians spend an average of 54.6 hours per week working.

Table 1 also lists specialties ranked by the number of respondents. The greatest number of physicians are in family medicine followed by internal medicine and then pediatrics.

Specialties that are consistently at the extremes and consistently statistically different from all specialties combined ($P < .05$, χ^2 test) are geriatric internal medicine, dermatology, pediatrics, internal medicine, and obstetrics-gynecology. But these χ^2 tests in Table 1 do not adjust for confounders.

The distribution of satisfaction need not be uniform for any given specialty. The distribution might be bimodal.

Table 1. Descriptive Statistics

| Variable/Description | Frequency | Very Satisfied, % | Dissatisfied, % | All Other Responses, % | P Values for χ^2 Test |
|---|------------|-------------------|-----------------|------------------------|----------------------------|
| Entire sample | 12 474 | 42.3 | 17.6 | 40.1 | ... |
| Control variables | | | | | |
| Age, y | | | | | |
| <35 | 604 | 46.7 | 7.6 | 45.7 | <.01 |
| 35-44 | 4611 | 41.9 | 13.6 | 44.5 | <.01 |
| 45-54 | 4050 | 40.8 | 18.6 | 40.6 | .03 |
| 55-64 | 2008 | 41.3 | 23.5 | 35.2 | <.01 |
| 65-74 | 1019 | 47.8 | 24.6 | 27.6 | <.01 |
| ≥75 | 182 | 50.0 | 24.7 | 25.3 | <.01 |
| Board certified | 9854 | 43.5 | 16.2 | 40.3 | <.01 |
| Foreign medical school graduate | 2545 | 34.5 | 23.9 | 41.6 | <.01 |
| Female sex | 2570 | 42.2 | 15.6 | 42.2 | .01 |
| Percentage of revenue from managed care | Continuous | 39.9* | 18.3* | 41.8* | Continuous |
| Region of practice | | | | | |
| New England | 1082 | 44.4 | 14.0 | 41.6 | .03 |
| Mid Atlantic | 1948 | 40.9 | 19.1 | 40.0 | .44 |
| East north Central | 2309 | 43.7 | 15.0 | 41.3 | .04 |
| West north Central | 352 | 51.1 | 11.6 | 37.3 | .03 |
| South Atlantic | 2364 | 41.1 | 19.4 | 39.5 | .43 |
| East south Central | 316 | 48.4 | 12.3 | 39.3 | .02 |
| West south Central | 1189 | 45.7 | 15.4 | 38.9 | .05 |
| Mountain | 910 | 40.2 | 21.9 | 37.9 | .03 |
| Pacific | 2004 | 38.7 | 20.1 | 41.2 | .13 |
| Rural/town† | 1073 | 47.4 | 13.5 | 39.1 | <.01 |
| Income, \$ | | | | | |
| <50 000 | 504 | 40.1 | 21.8 | 38.1 | .08 |
| 50 000-99 999 | 2292 | 38.6 | 21.2 | 40.2 | <.01 |
| 100 000-149 999 | 3973 | 40.3 | 16.4 | 43.3 | <.01 |
| 150 000-199 999 | 2469 | 41.6 | 18.0 | 40.0 | .75 |
| 200 000-249 999 | 1372 | 45.6 | 15.7 | 38.7 | .03 |
| 250 000-299 999 | 714 | 54.1 | 13.2 | 32.7 | <.01 |
| ≥300 000 | 1150 | 47.3 | 16.8 | 35.9 | <.01 |
| Increased work hours in previous week | Continuous | 42.3* | 16.8* | 40.8* | Continuous |
| Full owner (sole proprietor) | 4291 | 39.5 | 24.2 | 36.3 | <.01 |
| Part owner (partner) | 2807 | 44.9 | 15.0 | 40.1 | <.01 |
| Specialty | | | | | |
| Family practice | 2723 | 42.8 | 16.9 | 40.3 | <.01 |
| Internal medicine | 2488 | 36.5 | 20.3 | 43.2 | <.01 |
| Pediatrics | 1729 | 48.1 | 12.6 | 39.3 | <.01 |
| Other specialty (n<40) | 518 | 50.2 | 13.9 | 35.9 | <.01 |
| Psychiatry | 490 | 38.6 | 22.0 | 39.4 | .03 |
| Obstetrics-gynecology | 479 | 34.4 | 24.2 | 41.4 | <.01 |
| Emergency medicine | 421 | 44.4 | 13.3 | 42.3 | .05 |
| General practice | 410 | 36.1 | 25.1 | 38.8 | <.01 |
| General surgery | 388 | 43.0 | 20.4 | 36.6 | .25 |
| Orthopedic surgery | 327 | 47.1 | 19.3 | 33.6 | .06 |
| Ophthalmology | 324 | 41.4 | 21.0 | 37.6 | .27 |
| Cardiovascular disease-cardiology | 267 | 43.8 | 16.5 | 39.7 | .80 |
| Gastroenterology | 169 | 38.5 | 19.5 | 42.0 | .53 |
| Urology | 152 | 48.0 | 13.8 | 38.2 | .32 |
| Dermatology | 148 | 56.1 | 10.8 | 33.1 | <.01 |
| Otolaryngology and rhinolaryngology | 147 | 38.8 | 25.2 | 36.0 | .04 |
| Neurology | 136 | 39.0 | 16.2 | 44.8 | .58 |
| Pulmonary diseases | 123 | 33.3 | 17.9 | 48.8 | .09 |
| Plastic surgery | 104 | 43.3 | 23.1 | 33.6 | .21 |
| Medical oncology | 97 | 50.5 | 11.3 | 38.2 | .15 |
| Pediatric psychiatry | 96 | 40.6 | 19.8 | 39.6 | .85 |
| Physical medicine and rehabilitation | 87 | 39.1 | 12.6 | 48.3 | .21 |
| Nephrology | 78 | 46.2 | 9.0 | 44.8 | .15 |
| Cardiothoracic and thoracic surgery | 73 | 53.4 | 17.8 | 28.8 | .14 |
| Occupational medicine | 73 | 43.8 | 15.1 | 41.1 | .86 |
| Neurological surgery | 66 | 47.0 | 15.2 | 37.8 | .74 |
| Rheumatology | 61 | 42.6 | 18.0 | 39.4 | .99 |
| Geriatric internal medicine | 57 | 59.6 | 7.0 | 33.4 | .01 |
| Allergy and immunology | 56 | 48.2 | 10.7 | 41.1 | .40 |
| Endocrinology and metabolism | 49 | 44.9 | 10.2 | 44.9 | .32 |
| Infectious diseases | 48 | 50.0 | 6.3 | 42.7 | .11 |
| Neonatal and perinatal medicine | 46 | 58.7 | 13.0 | 28.3 | .09 |
| Gynecology | 44 | 27.3 | 25.0 | 47.7 | .15 |

*For continuous variables, the percentage applies to 51 to 60 hours for "increased work hours in previous week"; 40% to 50% for "percentage of revenue from managed care."

†Population less than 200 000.

Table 2. Logistic Regression Results for "Very Satisfied"*

| Covariate | Odds Ratio | Lower 95% Confidence Limit | Upper 95% Confidence Limit |
|---------------------------------------|------------|----------------------------|----------------------------|
| Age, y | | | |
| <35 | 1.30 | 1.12 | 1.50 |
| 35-44 | 1.00† | ... | ... |
| 45-54 | 0.97 | 0.87 | 1.07 |
| 55-64 | 1.08 | 0.97 | 1.21 |
| 65-74 | 1.55 | 1.33 | 1.80 |
| ≥75 | 1.76 | 1.30 | 2.38 |
| Board certified | 1.19 | 1.09 | 1.31 |
| Foreign school graduate | 0.73 | 0.66 | 0.81 |
| Female sex | 1.08 | 0.97 | 1.20 |
| Revenue from managed care | 0.998‡ | 0.996‡ | 0.999‡ |
| Region of practice | | | |
| New England | 1.22 | 1.00 | 1.49 |
| Mid Atlantic | 1.06 | 0.85 | 1.33 |
| East north Central | 1.12 | 0.93 | 1.35 |
| West north Central | 1.51 | 1.24 | 1.84 |
| South Atlantic† | 1.00 | ... | ... |
| East south Central | 1.22 | 0.91 | 1.62 |
| West south Central | 1.12 | 0.92 | 1.38 |
| Mountain | 1.01 | 0.80 | 1.27 |
| Pacific | 0.99 | 0.79 | 1.23 |
| Rural/town§ | 1.23 | 1.07 | 1.42 |
| Income, \$ | | | |
| <50 000 | 0.92 | 0.73 | 1.15 |
| 50 000-99 999 | 0.87 | 0.79 | 0.96 |
| 100 000-149 999† | 1.00 | ... | ... |
| 150 000-199 999 | 1.14 | 1.04 | 1.25 |
| 200 000-249 999 | 1.38 | 1.22 | 1.57 |
| 250 000-299 999 | 1.98 | 1.69 | 2.32 |
| ≥350 000 | 1.57 | 1.36 | 1.82 |
| Increased work hours in previous week | 1.00 | 0.99 | 1.00 |
| Full owner (sole proprietor) | 0.82 | 0.74 | 0.92 |
| Part owner (partner) | 0.95 | 0.85 | 1.06 |

*Regression also includes dummy variables for 32 of 33 specialties; see Table 3. Results in Tables 2 and 3 are generated from the same logistic regression ($F_{59,3690} = 15.44; P < .001$).

†Comparison group.

‡Continuous variable. Rounding to 2 places after decimal is misleading.

§Population less than 200 000.

Orthopedic surgery is above the mean for both "very satisfied" and "dissatisfied." This suggests that orthopedists are sharply divided. However, the distribution might be bell shaped, with few responses at the extremes. Specialists within physical medicine and rehabilitation are less likely than other physicians to be "satisfied" but also less likely to be "dissatisfied." This suggests that few specialists in physical medicine have extreme sentiments regarding career satisfaction.

A logistic regression was run for which log of the odds of being very satisfied was the dependent variable (**Table 2** and **Table 3**), and another was run for being dissatisfied (**Table 4** and **Table 5**). That is, only 1 regression generated the results in both Tables 2 and 3, whereas a separate regression generated results in both Tables 4 and 5. Results on the control variables appear in Tables 2 and 4. Results on the 33 specialties appear in Tables 3 and 5.

First, consider Table 2 (for which the dependent variable is being very satisfied). Age younger than 35 years,

Table 3. Logistic Regression Results for "Very Satisfied," Ranked From High to Low Odds Ratio*

| Specialty | Odds Ratio | Lower 95% Confidence Limit | Upper 95% Confidence Limit |
|--------------------------------------|------------|----------------------------|----------------------------|
| Geriatric internal medicine | 2.04 | 1.19 | 3.49 |
| Neonatal and perinatal medicine | 1.89 | 1.04 | 3.42 |
| Infectious diseases | 1.49 | 0.79 | 2.81 |
| Dermatology | 1.48 | 1.01 | 2.15 |
| Pediatrics | 1.36 | 1.21 | 1.53 |
| Other specialty (n < 40) | 1.27 | 1.05 | 1.53 |
| Allergy and immunology | 1.21 | 0.69 | 2.10 |
| Medical oncology | 1.14 | 0.73 | 1.80 |
| Endocrinology and metabolism | 1.11 | 0.65 | 1.90 |
| Cardiothoracic and thoracic surgery | 1.08 | 0.67 | 1.73 |
| Nephrology | 1.06 | 0.64 | 1.74 |
| Pediatric psychiatry | 1.03 | 0.66 | 1.61 |
| Occupational medicine | 1.02 | 0.62 | 1.67 |
| Urology | 1.01 | 0.71 | 1.43 |
| Family practice† | 1.00 | ... | ... |
| Rheumatology | 1.00 | 0.62 | 1.60 |
| Emergency medicine | 0.91 | 0.73 | 1.13 |
| Orthopedic surgery | 0.89 | 0.69 | 1.16 |
| Psychiatry | 0.88 | 0.72 | 1.09 |
| Neurological surgery | 0.87 | 0.49 | 1.53 |
| Neurology | 0.87 | 0.60 | 1.25 |
| Cardiovascular disease-cardiology | 0.86 | 0.65 | 1.13 |
| General surgery | 0.85 | 0.67 | 1.08 |
| Plastic surgery | 0.85 | 0.54 | 1.34 |
| General practice | 0.84 | 0.64 | 1.10 |
| Physical medicine and rehabilitation | 0.80 | 0.49 | 1.30 |
| Internal medicine | 0.80 | 0.69 | 0.92 |
| Ophthalmology | 0.75 | 0.60 | 0.94 |
| Gasteroenterology | 0.73 | 0.54 | 0.98 |
| Otolaryngology and rhinolaryngology | 0.70 | 0.50 | 0.98 |
| Obstetrics-gynecology | 0.63 | 0.52 | 0.76 |
| Pulmonary diseases | 0.61 | 0.43 | 0.86 |
| Gynecology | 0.42 | 0.20 | 0.88 |

*Additional covariates in the model include age, board certified, foreign medical school graduate, female sex, percentage of revenue from managed care, region of practice, rural/town (population <200 000), income, increased work hours in previous week, full owner, and part owner; see Table 2 (same regression as in Table 2).

†Comparison group.

65 to 74 years, and 75 and older are all positively associated with being very satisfied. The **Figure** suggests a U-shaped curve and describes the relation between age and being very satisfied. Being board certified, rural or town residence, living in New England or the west north Central, and higher income are positively and strongly statistically associated with being very satisfied. The largest odds ratio in this "positive association" group belongs to income between \$250 000 and \$299 999. Persons in this earnings bracket are 98% more likely to report being very satisfied than persons in the \$100 000 to \$149 999 bracket.

Having graduated from a foreign medical school, being a full owner of a practice, income between \$50 000 and \$99 999, and greater involvement in managed care are strongly and negatively associated with being very satisfied. Within this "negative association" group, being a

Table 4. Logistic Regression Results for "Dissatisfied"*

| Covariate | Odds Ratio | Lower 95% Confidence Limit | Upper 95% Confidence Limit |
|---|------------|----------------------------|----------------------------|
| Age, y | | | |
| <35 | 0.52 | 0.39 | 1.16 |
| 35-44† | 1.00 | ... | ... |
| 45-54 | 1.36 | 1.22 | 1.52 |
| 55-64 | 1.65 | 1.44 | 1.90 |
| 65-74 | 1.64 | 1.35 | 2.00 |
| ≥75 | 1.64 | 1.12 | 2.40 |
| Board certified | 0.81 | 0.72 | 0.91 |
| Foreign medical school graduate | 1.36 | 1.23 | 1.52 |
| Female sex | 1.00 | 0.86 | 1.14 |
| Percentage of revenue from managed care | 1.01 | 1.004‡ | 1.02 |
| Region of practice | | | |
| New England† | 1.00 | ... | ... |
| Mid Atlantic | 1.33 | 0.99 | 1.78 |
| East north Central | 1.18 | 0.92 | 1.51 |
| West north Central | 0.90 | 0.54 | 1.48 |
| South Atlantic | 1.54 | 1.13 | 2.10 |
| East south Central | 1.03 | 0.75 | 1.40 |
| West south Central | 1.27 | 1.00 | 1.63 |
| Mountain | 1.66 | 1.24 | 2.22 |
| Pacific | 1.42 | 1.08 | 1.87 |
| Rural/town§ | 0.74 | 0.60 | 0.90 |
| Income, \$ | | | |
| <50 000 | 1.42 | 1.08 | 1.87 |
| 50 000-99 999 | 1.38 | 1.22 | 1.57 |
| 100 000-149 999† | 1.00 | ... | ... |
| 150 000-199 999 | 0.99 | 0.85 | 1.15 |
| 200 000-249 999 | 0.76 | 0.62 | 0.95 |
| 250 000-299 999 | 0.60 | 0.46 | 0.78 |
| ≥300 000 | 0.75 | 0.62 | 0.91 |
| Increased work hours in previous week | 1.01 | 1.003‡ | 1.02 |
| Full owner (sole proprietor) | 1.72 | 1.55 | 1.92 |
| Part owner (partner) | 1.18 | 1.02 | 1.37 |

*Regression also includes dummy variable for 32 of 33 specialties; see Table 5. Results in Tables 4 and 5 are generated from the same logistic regression ($F_{59,3690} = 15.44; P < .001$).

†Comparison group.

‡Continuous variable. Rounding to 2 places after decimal is misleading.

§Population less than 200 000.

foreign medical school graduate, and being a full owner generate the lowest odds ratios.

Incomes below \$100 000 generate odds ratios below 1.0. Incomes above \$150 000 generate odds ratios above 1.0. The general pattern is for these odds ratios to rise with higher income. Moreover, upper and lower confidence limits tend to be either below 1.0 for low income or above 1.0 for high income. These results suggest that, after controlling for work hours, income is among the most important predictors of being very satisfied.

Table 4 presents results for dissatisfied, again, among control variables. Residing outside a city with a population greater than 200 000 (the rural/town variable) and high income are negatively and strongly statistically significant in their associations with being dissatisfied. Within the "negative association" group, income between \$250 000 and \$299 999 generates the lowest odds ratio. Persons in that income bracket are 40% less likely than persons in the \$100 000 to \$149 999 bracket to report dissatisfaction. Posi-

Table 5. Logistic Regression Results for "Dissatisfied," Ranked From High to Low Odds Ratio*

| Specialty | Odds Ratio | Lower 95% Confidence Limit | Upper 95% Confidence Limit |
|--------------------------------------|------------|----------------------------|----------------------------|
| Otolaryngology | 1.78 | 1.29 | 2.46 |
| Obstetrics-gynecology | 1.61 | 1.27 | 2.06 |
| Ophthalmology | 1.52 | 1.05 | 2.18 |
| Plastic surgery | 1.46 | 0.91 | 2.33 |
| Gastroenterology | 1.40 | 0.95 | 2.06 |
| Orthopedic surgery | 1.36 | 1.05 | 1.78 |
| Gynecology | 1.32 | 0.59 | 2.96 |
| Cardiothoracic and thoracic surgery | 1.27 | 0.60 | 2.69 |
| Internal medicine | 1.22 | 1.02 | 1.45 |
| General surgery | 1.22 | 0.92 | 1.60 |
| Pulmonary diseases | 1.21 | 0.73 | 2.01 |
| Psychiatry | 1.16 | 0.93 | 1.45 |
| Emergency medicine | 1.09 | 0.80 | 1.48 |
| Cardiovascular disease-cardiology | 1.07 | 0.75 | 1.52 |
| Pediatric psychiatry | 1.05 | 0.67 | 1.65 |
| Rheumatology | 1.02 | 0.47 | 2.22 |
| Family practice† | 1.00 | ... | ... |
| Neurological surgery | 0.99 | 0.43 | 2.27 |
| General practice | 0.97 | 0.74 | 1.27 |
| Occupational medicine | 0.97 | 0.42 | 2.23 |
| Neurology | 0.91 | 0.57 | 1.45 |
| Neonatal and perinatal medicine | 0.82 | 0.32 | 2.13 |
| Other specialty (n < 40) | 0.82 | 0.61 | 1.09 |
| Urology | 0.81 | 0.49 | 1.35 |
| Physical medicine and rehabilitation | 0.77 | 0.43 | 1.39 |
| Medical oncology | 0.71 | 0.38 | 1.33 |
| Dermatology | 0.66 | 0.40 | 1.09 |
| Pediatrics | 0.65 | 0.55 | 0.77 |
| Allergy and immunology | 0.60 | 0.25 | 1.44 |
| Nephrology | 0.52 | 0.24 | 1.12 |
| Endocrinology and metabolism | 0.49 | 0.22 | 1.12 |
| Geriatric internal medicine | 0.34 | 0.13 | 0.92 |
| Infectious diseases | 0.33 | 0.12 | 0.92 |

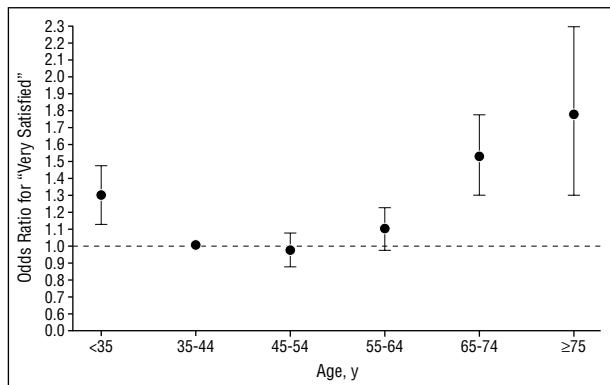
*Additional covariates in the model include age, board certified, foreign medical school graduate, female sex, percentage of revenue from managed care, region of practice, rural/town (population <200 000), income, increased work hours in previous week, full owner, and part owner; see Table 4 (same regression as in Table 4).

†Comparison group.

tive and statistically significant associations are found for being a foreign medical school graduate; living in the south Atlantic, west south Central, Mountain, and Pacific states; being either a full owner or a partner; receiving a higher percentage of revenue from managed care; and increased weekly work hours. Within this positive association group, being a full owner, followed by living in the Mountain states, generate the largest odds ratios.

Dissatisfaction tends to rise with age, but levels off at age 65 years. Increased work hours are associated with more dissatisfaction.

We turn now to results on the specialties (Tables 3 and 5). Table 3 presents the ranking of specialties for being very satisfied. The highest statistically significant odds ratios in Table 3 belong to geriatric internal medicine, neonatal-perinatal medicine, dermatology, pediatrics, and "all other" specialties. Persons in these specialties are 104%,



Odds ratios for "very satisfied" with the covariate age. Errors bars represent confidence interval and the dashed line indicates odds ratio = 1.00.

89%, 48%, 36%, and 27%, respectively, more likely than persons in family practice to report being very satisfied.

Table 5 presents the ranking of specialties for dissatisfied. At the top of the list, the statistically significant odds ratios are otolaryngology and rhinolaryngology, obstetrics-gynecology, ophthalmology, orthopedic surgery, and internal medicine. Persons in these specialties are 78%, 61%, 51%, 36%, and 22%, respectively, more likely than persons in family practice to report being dissatisfied. The statistically significant results on specialties from Tables 3 and 5 are summarized below.

High Percentages in "Very Satisfied" Category
 Geriatric internal medicine
 Neonatal-perinatal medicine
 Dermatology
 Pediatrics
 All other specialties (n<40)

High Percentages in "Dissatisfied" Category
 Otolaryngology
 Obstetrics-gynecology
 Ophthalmology
 Orthopedic surgery
 Internal medicine

COMMENT

More than 70% of US physicians reported being satisfied or very satisfied with their careers in medicine. These high satisfaction levels among most physicians, despite the many challenges of our changing health care system, are testaments to the enduring rewards of the science and practice of medicine. However, only about 2 out of 5 physicians are very satisfied with their careers, and nearly 1 in 5 are dissatisfied. These somewhat mixed results are disappointing given the enormous individual and societal investments required to prepare a fully-trained physician.

In this discussion, we first consider the results on the specialty variables and on the control variables. Then we compare these results with the literature and consider the implications of our results and limitations of our study. Finally, we draw a conclusion.

RESULTS OF INTERSPECIALTY AND OTHER COMPARISONS

The interspecialty comparisons include some expected and some unexpected results. Obstetrics-gynecology specialists report high dissatisfaction, perhaps related to rising expectations for perfect birth outcomes and high medicolegal risks.²⁴ At the other end of the spectrum, derma-

tology has consistently been viewed as one of the most attractive specialties by graduating medical students owing to its controllable lifestyle, relatively narrow focus, and burgeoning scientific knowledge base.¹⁴

More surprising is the relatively high proportion of dissatisfied physicians among those practicing certain "procedural" specialties (eg, ophthalmology, pulmonary medicine, otolaryngology, and orthopedic surgery). In contrast, physicians practicing some "cognitive" specialties (eg, infectious diseases, geriatrics, and pediatrics) were unlikely to be dissatisfied. This is puzzling, especially given the high income and prestige associated with the "procedural" specialties. But it may not be the historical income and prestige levels that are relevant but rather the change in these levels that has occurred in recent years that is relevant. There has been considerable loss of income, autonomy, and job openings for procedural specialties over the past 15 years with the advance of managed care.²⁵ Sharp declines in job-opening advertisements from 1990 to 1996 occurred for most of the procedural specialties.²⁶ Small declines and some increases (family medicine) occurred among the cognitive specialties.²⁶ The surgical subspecialties in particular have been among the hardest hit by Medicare payment reform and managed care.²⁷ Other CTS results suggest that procedural specialties are more likely to perceive problems in providing high quality care under various managed care arrangements than are primary care physicians.²⁸ Although we enter covariates reflecting \$50 000 increments of income and percentage of revenue from managed care into the equation, these covariates are not likely to capture all of the subtle influences of income and managed care. Moreover, we do not attempt to control for any direct measure of autonomy.

Some of the interspecialty differences in satisfaction may be explained by self-selection. For example, Friedman and Slatt²⁹ found personality differences in introversion and extroversion across students choosing primary care, obstetrics-gynecology, and surgical specialties. The broad concept of "personality," therefore, could confound the relation between specialty and satisfaction.

We turn now to the control variables. The age results suggest a nonlinear relation. A high percentage of young physicians are very satisfied and an even higher percentage of physicians aged 65 and older report being very satisfied (Figure). This may be owing to the enthusiasm and idealism of youth and self-selection among the elderly. Physicians who dislike their careers probably retire by age 65 years. Physicians who do not retire by age 65 years probably derive considerable satisfaction from their jobs.

The work hours variable is strongly and positively associated with dissatisfaction. It is statistically insignificant in its association with being very satisfied. These results underscore the point that being very satisfied is not just the opposite of being dissatisfied. The results could be explained by the marginal utility theory of work in economics. This theory holds that leisure is preferred to work, in general, and that increased work hours generate increased "disutility" (unhappiness) at an increasing rate.³⁰ The "increasing rate" more likely occurs during a major shift from somewhat satisfied to dissatisfied as opposed to the minor shift from very satisfied to somewhat satisfied.

Results for foreign medical school graduates are strong and consistent; they are much less likely to report being very satisfied and much more likely to report being dissatisfied than US graduates. These results are consistent with the reported high rates of attrition among foreign medical school graduates in US residency programs, the reported clash of cultures between immigrants and US citizens, and possible discrimination.³¹

Higher income is associated with increased likelihood of being very satisfied and a decreased likelihood of being dissatisfied. The income odds ratios also tend to rise or fall monotonically and generate relatively narrow confidence intervals compared with all other covariates. These results are consistent with the view that feeling adequately rewarded in financial terms is an important part of overall career satisfaction.

COMPARISON WITH LITERATURE

McMurray et al¹ analyzed 5704 male and female physicians in the Physician Work Life Study, with a concern for sex differences. They found that women were more likely than men to be dissatisfied. We found women to be neither more nor less likely than men to report being very satisfied or dissatisfied. McMurray et al¹ did not discuss associations between either satisfaction or burnout on one hand and specialty on the other.

Schulz et al⁵ reported results on 545 physicians in Dane County, Wisconsin. They created only 14 specialty categories (eg, general surgery, general internal medicine, pediatrics, obstetrics, and family practice). After adjusting for control variables such as age, sex, employment in a health maintenance organization, and solo practice, they found only 1 statistically significant difference: psychiatrists reported less career satisfaction than surgeons. But there are limitations to the study by Schulz et al.⁵ They surveyed physicians in only 1 county in Wisconsin, and the data were from 1986. They did not control for as many variables as we did. Finally, they considered 14 specialties. We considered 33.

Frank et al² analyzed a nationally representative sample of 4501 US female physicians. They considered 18 specialties. Frank et al² did not seek to produce a ranking of specialties as we did. In multivariate regressions that included a number of covariates (age, work hours, number of children in family), no statistically significant differences across specialties were found. However, age was found to be positively and statistically significant in its association with high satisfaction. Marital status was not found to be statistically significant. They found that 31% of female physicians had seriously considered leaving medicine.

IMPLICATIONS

Our results might be useful to medical students making career decisions. Presumably, students would want a specialty for which a high percentage of incumbents are very satisfied and/or a low percentage are dissatisfied, other things being equal.

These results will also be of interest to specialty societies concerned with both the well being of their members

and the attractiveness of their specialty to future generations of students. Some specialties already conduct detailed surveys of practitioner satisfaction and have used the results to help plan interventions at the individual, organizational, and political levels.^{2,6} To the extent that pervasive discontent may be associated with adverse organizational and patient outcomes, these results should be of interest to managers, policy makers, and residence training directors. For example, if discontent continues within some specialties, not only will fewer students choose that specialty, but some incumbents will exit it. In the language of economics, the supply will drop. To maintain equilibrium, either wages would rise or working conditions would improve or both, in a free market. But market forces are somewhat weak in the regulated environment of medicine. It therefore becomes even more important in medicine than other fields for residency directors, managers, and policy makers to take note of trends in specialty satisfaction and design interventions to ensure equilibrium between demand and supply.

The experience of anesthesiologists during the 1990s, when this specialty lost some of its appeal, should serve as a warning. It is generally acknowledged that a miscalculation of demand within an influential study, loss of job autonomy, and income left students fearful of selecting this specialty.^{32,33}

Another implication involves the future mix of specialists in the United States.⁹ If specialties that register high on dissatisfaction are likely to shrink, our results are important for forecasting the future mix of specialists.

Finally, of particular interest is the potential effect on quality of care that results when a high percentage of physicians in otolaryngology, obstetrics-gynecology, ophthalmology, orthopedic surgery, and internal medicine are dissatisfied. The health of the public, in general, may worsen.

LIMITATIONS AND STRENGTHS

We begin with limitations. First, the data are self-reported. However, this is true for all survey data sets. Moreover, only the physician knows his or her level of satisfaction.

Second, the data are cross-sectional so that causal relations are subject to interpretation. For example, the rural/town variable is consistent and strongly statistically significant in its positive correlation with very satisfied. We cannot determine, however, whether it is work in rural areas that improves satisfaction or whether it is the type of physician (already satisfied) who chooses to live in a rural area. Similar problems plague the interpretation of the strongly statistically significant correlations for the board-certified, foreign medical school graduate, geographic region, and full owner variables. These correlations, again, could reflect self-selection. Nevertheless, a number of authors have assigned a casual interpretation to the correlation between being a full owner and dissatisfaction. According to these authors, it is being a full owner in the age of managed care that leads to lower satisfaction.²¹

But our focus is not on rural residence, region, sole proprietorship, or managed care. We enter each of these

as control variables in our analyses. We are interested in producing the first ranking of specialties according to satisfaction using the CTS data. Future researchers may improve on these rankings with longitudinal data or more sophisticated statistical models.

Third, the data are limited in that some variables are not available. Physician demographic characteristics such as race, marital status, and number of children in the family have been shown to correlate with satisfaction and are standard covariates in economic studies of labor markets.^{2,30} Finally, income is recorded in crude \$50 000 increments in the CTS.

Fourth, response rates may differ across specialty. But this is true for any covariate. The CTS administrators maintain that these data are representative of physicians in the nation.²⁰ Finally, we do not analyze specialties with fewer than 40 incumbents.

Fifth, little solid evidence exists regarding why any specialty would rank high or low. But the CTS data are highly regarded, and the results on the control variables are believable (eg, experience with managed care, being a foreign graduate, and increased work hours are associated with dissatisfaction, whereas higher income and being young are associated with high satisfaction). We conclude that whereas the reasons for given specialties being high or low on the list may not be clear, the list is likely to be accurate and will generate future research into discovering those reasons.

There are also strengths of this study. First, the CTS data set is large and designed to represent the nation. The sample size of the CTS is larger than any previous data set used to analyze physician career satisfaction. Second, we control for most of the variables identified in the literature. Third, we consider more specialties than any prior study. Fourth, our findings (with respect to pediatrics and obstetrics-gynecology, for example) are consistent with contemporary impressions of satisfaction across specialties, thus lending credibility to our study. Finally, the data set is highly regarded and has been productively analyzed within other rigorous studies.^{21,28}

CONCLUSIONS

We used a large, nationally representative sample of physicians to assess differences in career satisfaction across 33 specialties. Considerable variations were found; physicians were not equally satisfied. These results may serve to bring greater research and policy attention to why some specialists derive considerably more satisfaction from their work than others.

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