

Time and Money

A Retrospective Evaluation of the Inputs, Outputs, Efficiency, and Incomes of Physicians

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Background: Physicians' concerns with the health care system focus on having less time with their patients and needing to work harder to maintain incomes. We sought to determine whether physicians are working longer hours and whether their incomes are declining.

Methods: Using survey data, we conducted a retrospective analysis of physician inputs, outputs, efficiency, and incomes for generalists, general internists, general surgeons, pediatricians, and obstetrician-gynecologists from 1987 to 1998.

Results: Physician inputs (as measured by the average hours worked in professional activities) showed little absolute change across specialties over time. Outputs (as measured by the total number of patient visits per week) decreased between 9% and 28%, depending on the specialty. Efficiency (the proportion of time spent in direct patient care and the amount of time spent during a typi-

cal office visit) remained stable over the time examined. Consumer price index inflation-adjusted annual incomes increased considerably over the time period examined (42% for general internists, 28% for pediatricians, 13% for generalists, and 8% for general surgeons); only obstetricians-gynecologists showed a net loss of annual income when adjusting for inflation (a 6% loss).

Conclusions: Our findings do not confirm the prevailing concern that physicians are working harder or longer or that their incomes are declining, but they offer an explanation of how physicians are maintaining incomes without increasing work inputs. There is a great deal of dissatisfaction with the health care system among physicians; exploration of perceptual reasons for that dissatisfaction may outline a course of action needed to resolve it.

Arch Intern Med. 2003;163:944-948

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PHYSICIANS ARE dissatisfied with the health care system. They have complained that managed care administration requirements have adversely affected their incomes and the quality and length of time they spend with patients.¹⁻⁶ A recent survey of more than 1700 practicing physicians found that only one fourth of respondents were very satisfied with the practice of medicine.⁷ Some concerns about the growing level of dissatisfaction among physicians are that they might supplement their incomes in unprofessional ways⁸ or enter other professional fields instead of medicine.⁹

Studies do not support that the lengths of office visits have been shortened.^{10,11} We sought to determine whether physicians have had to work harder, by expanding total work hours or by increasing the number of patient visits they provide, and whether their incomes have declined in the recent past. Using existing data sources, we examined the in-

puts, outputs, efficiency, and incomes of physicians over a 12-year period.

METHODS

We used existing data compiled by the American Medical Association (AMA) in their socioeconomic monitoring system (SMS), an annual survey of physician-level data on a broad variety of characteristics, including weeks and hours of practice, practice time allocation, utilization patterns, and physician earnings.¹²⁻²⁴ The survey is conducted by telephone and is designed to provide representative information on the population of all nonfederal physicians who spend the greatest proportion of their time in patient care activities. The SMS surveys are administered annually to a random sample of a subset of the AMA Masterfile. The AMA Masterfile contains current and historical information on every doctor of medicine in the United States, including both members and nonmembers of the AMA. The subset from which the random sample is taken is limited to nonfederal, patient care physicians and excludes doctors of osteopathy, graduates of foreign medical schools who are only

temporarily licensed to practice in the United States, inactive physicians, physicians who were sampled in SMS surveys during the last 5 years, physicians listed as “do not contact” in the Masterfile, physicians not practicing in the United States, and unlicensed physicians. After the initial sample selection is made, physicians who spend fewer than 20 hours per week caring for patients and physicians who cannot be located by telephone are excluded.

Although the survey has been conducted for much longer, we limited our analysis to the period from 1987 to 1998 for 3 reasons. First, the method used by the AMA in the survey changed in the mid-1980s, rendering data on work hours and patient visits collected after 1985 difficult to compare with previous years. Second, managed care penetration tripled during the time period examined,²⁵ as reflected by the number of physicians who reported participation in health maintenance organizations, managed care contracts, and capitated payment mechanisms in the SMS.¹⁵⁻²⁴ Because a doubling in the level of managed care penetration was estimated to reduce physicians’ annual earnings by 7% to 11% and hourly earnings by 6% to 9%,⁴ we anticipated finding a significant drop in real annual earnings and hourly earnings. Finally, the time period chosen includes the 1992 implementation of the Medicare Fee Schedule, which was expected to increase the annual income for family practitioners by 30% and that for general internists by 7%, while decreasing the annual income for general surgeons by 7%.^{26,27}

We examined 5 specialty groups: family practitioners, general internists, general surgeons, pediatricians, and obstetrician-gynecologists. Specialty information reflects physician self-designated practice specialty from the survey. By limiting our analysis to general internists and general surgeons, we excluded subspecialists, such as gastroenterologists, cardiologists, and orthopedic surgeons, from the analysis. On average, each year the interview process collected information on 562 family practitioners (range over the time period examined, 499-646), 528 general internal medicine physicians (422-626), 238 general surgeons (194-270), 324 pediatricians (290-353), and 278 obstetrician-gynecologists (251-314). Although the number of respondents within each specialty has remained fairly consistent over time, the response rates for all specialties examined have dropped somewhat over the time period studied (**Figure 1**). Although data on income and hours worked were available for radiologists, pathologists, anesthesiologists, and psychiatrists, we did not include them because data on number of patient visits were either not relevant or not available.

From the SMS, we extracted measures of physician input, output, efficiency, and income, as defined in the **Table**. For all measures, we used specialty- and year-specific data. As inputs, we used measures of physician time, including the time spent in all professional activities, time spent in direct patient care activities, and time spent holding office hours. Respondents reported each of these measures as a weekly figure. To calculate annual figures, we multiplied the hours worked per week by reported weeks worked per year. We used 2 measures of physician output: the number of office visits and the total number of visits in all settings (which includes hospital round visits, consultation visits, and surgical procedures). For efficiency measures, we examined how the time spent in professional activities was allocated to different activities (both direct patient care and office hours), whether the location of care had changed (by determining the proportion of all visits that were office visits), and the average time spent in each office visit. We calculated the average number of minutes spent in an office visit by dividing the number of reported office hours per week by the number of office visits per week, and multiplying by 60. To examine changes in income, we used the mean, after expenses, before-tax income as the primary measure of physician income. We examined the annual income, as reported to

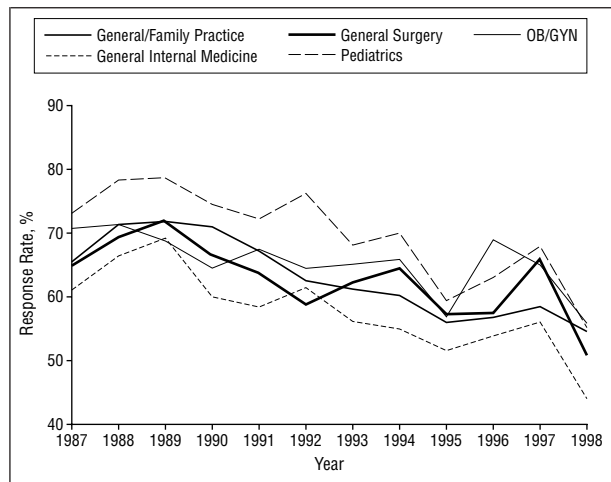


Figure 1. Response rate to the survey, by year and specialty. OB/GYN indicates obstetrics-gynecology.

Measures Used and Their Definitions*

Type	Measure	Symbol	Calculation
Input	Hours per week spent in professional activities	h	...
Input	Hours per week spent in direct patient care	h_{dpc}	...
Input	Office hours worked per week	h_o	...
Input	Weeks worked per year	W	...
Input	Hours per year spent in professional activities	H	$h \times W$
Output	Office visits per week	v_o	...
Output	Total visits per week	v	...
Efficiency	Proportion of time spent in direct patient care	...	$\frac{h_{dpc}}{h}$
Efficiency	Proportion of time spent in office hours	...	$\frac{h_o}{h}$
Efficiency	Proportion of total visits that are office visits	...	$\frac{v_o}{v}$
Efficiency	Minutes per office visit	M_o	$60 \times \frac{h_o}{v_o}$
Income	Annual income (mean, after expense, before tax)	I	...
Income	Income per professional hour worked	...	$\frac{I}{H}$
Income	Inflation-adjusted income (1998 dollars)	I_{Adj}	$I \times \frac{163}{CPI \text{ for Year}}$
Income	Income generated per patient visit	...	$\frac{I}{v \times W}$

*Ellipses indicate not applicable (calculated from previously defined variables).

the SMS, the inflation-adjusted annual income (in 1998 dollars), the annual income per hour worked in professional activities, and the annual income generated per patient visit. Because we found substantial year-to-year variation in the data, we calculated 3-year moving averages for each variable examined. Therefore, a particular year’s data point represents the average of that year’s and the previous 2 years’ results for all calculated variables.

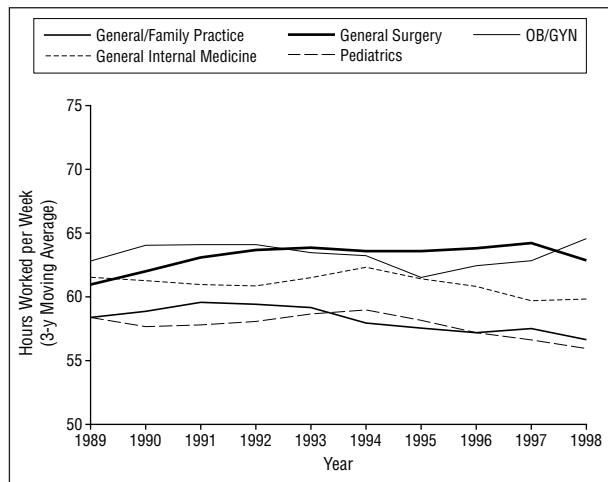


Figure 2. Input measure: 3-year moving average of the number of hours worked per week in professional activities, by specialty. OB/GYN indicates obstetrics-gynecology.

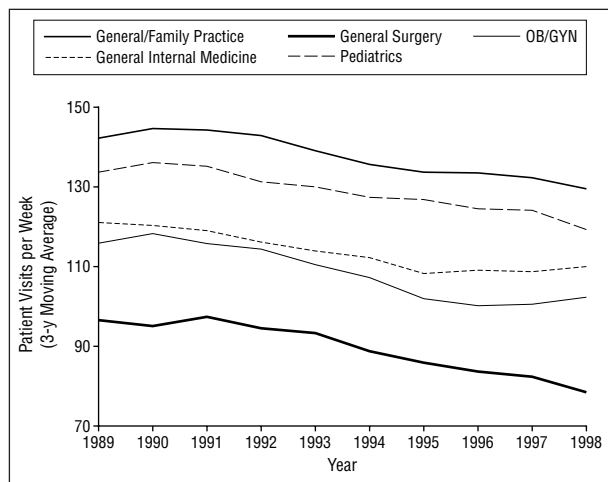


Figure 3. Output measure: 3-year moving average of the total number of patient visits per week, by specialty. OB/GYN indicates obstetrics-gynecology.

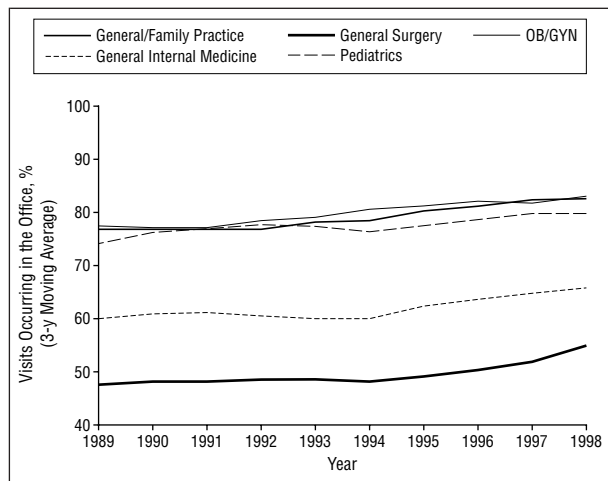


Figure 4. Efficiency measure: 3-year moving average of the proportion of visits that occurred in the office setting, by specialty. OB/GYN indicates obstetrics-gynecology.

Over the period examined, physician inputs, as measured by the 3-year moving average of the average hours spent in professional activities per week, showed little absolute change for each specialty (**Figure 2**). Examining year-over-year changes, family practitioners, general internists, surgeons, and pediatricians had an average of less than 1% change in professional hours per week, with all specialties showing a downward trend save obstetrics-gynecology. The findings were virtually identical when examining annual work hours.

Figure 3 shows that the number of patient visits per week decreased for all specialties over the time period examined. The 3-year moving average of 1998 total patient visit outputs has declined 9% for general internists (from 121 in 1989 to 110 in 1998), 9% for family practice physicians (142 in 1989 to 129), 11% for obstetrician-gynecologists (116 in 1990 to 102), 11% for pediatricians (134 in 1989 to 119), and 28% for general surgeons (96 in 1991 to 79). The number of office visits per week remained remarkably stable over the time period examined, declining an average of 0.2% per year for all specialties, suggesting that the decline in total patient visits was due to decreased numbers of hospital visits.

The proportion of time spent in office direct patient care and in office visits was also stable over the time period examined. While the proportion of time spent in office hours increased slightly for family practitioners and obstetrician-gynecologists (0.4% average increase per year) and for general internists and pediatricians (0.6% average increase per year), the proportion decreased by 0.2% for surgeons. Similarly, the proportion of time spent in patient care activities showed no average change, year over year, for surgeons, pediatricians, or obstetrician-gynecologists; family practitioners spent 0.1% more time per year, on average, in direct patient care activities while general internists spent 0.1% less time. However, as shown in **Figure 4**, the proportion of visits that occurred in the office increased for all specialties examined. Family practitioners and obstetrician-gynecologists had the slightest proportional increase, from 77% to 83% of all patient visits occurring in the office, or a 7% shift in visits to the office setting, while general surgeons had the greatest proportional increase, from 47% to 54% of all patient visits occurring in the office, or a 15% shift in visits to the office setting.

Similar to other recent findings, we found little change in the average amount of time spent during a typical office visit (**Figure 5**). In all cases, the 3-year moving average of the average amount of time spent during a typical office visit was higher in 1998 than it was in 1989. The change was most marked for obstetrics-gynecology, where an average visit lasted 12% longer in 1998 than in 1989 (21.6 minutes vs 19.3 minutes). All other specialties examined had an average year-over-year change of less than 0.5%.

During this time of stable work hours, declining numbers of patient visits, and stable or increasing lengths of office visits, increases in inflation-adjusted annual incomes were substantial (42% for general internists, 28% for pediatricians, 13% for family practitioners, and 8%

for general surgeons); only obstetrician-gynecologists showed a net loss of annual income when adjusting for inflation (6% loss, from \$234 000 in 1987 to \$221 000 in 1998, in 1998 dollars). While all specialties except obstetrics-gynecology experienced an increase in inflation-adjusted income per hour worked, upward trends were evident only for family practitioners, general internists, and pediatricians. Over the time period examined, the average year-over-year inflation-adjusted hourly incomes increases varied from 1.7% per year for family practitioners and surgeons, to 3.4% per year for pediatricians, and 3.8% per year for general internists. Obstetrician-gynecologists experienced an average yearly decline of 0.7% of inflation-adjusted income per professional hour worked. Without the large increase in 1998, surgeons would have experienced an average year-over-year decline of 2.1% in inflation-adjusted income per professional hour.

In contrast, the income generated per patient visit has increased considerably. Inflation-adjusted income generated per hour worked increased for all specialties, at an average rate of 3% per year, about double the average annual inflation rate for this period (Figure 6). On average, the annual increase in income generated per visit was 34 times that of the annual increase in the length of a typical visit; inflation-adjusted income generated per visit increased at 15 times the rate of increases in visit length.

COMMENT

We examined measures of physician input, output, efficiency, and income over a 12-year period. Physician work hours remained stable or decreased slightly. Physicians had fewer total patient visits and about the same number of office visits, demonstrating a shift of location of care to the office setting over time. Physicians' annual and hourly incomes increased markedly. After adjustment for inflation, increases in annual and hourly incomes were substantial for family practitioners, general internists, and pediatricians, were negligible for general surgeons, and were negative for obstetrician-gynecologists. Although the amount of time spent in a typical office visit showed minimal increases, the increases in the income generated per patient visit considerably outpaced inflation.

Physicians' ability to maintain their incomes in hourly and annual, and real and nominal terms were surprising given that health maintenance organization penetration increased so much during the period examined. Although managed care may have retarded the speed at which procedure-based physician incomes increased during the time period examined, we did not see the dramatic declines in physician incomes predicted with this level of increase in managed care penetration.⁴

Our findings offer little explanation about why physicians are dissatisfied with the health care system. Work hours are stable and, except for obstetrician-gynecologists, incomes are rising. The number of patient visits is declining, and there is no evidence that the time spent in each visit is decreasing. We found no evidence that physicians are spending more time in admin-

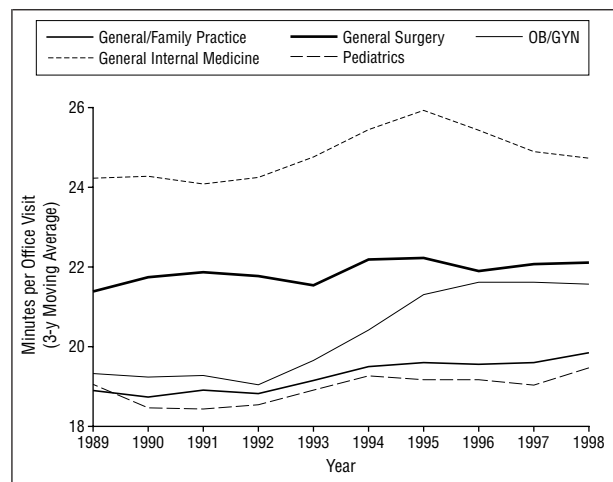


Figure 5. Efficiency measure: 3-year moving average of the average time spent in an office visit, by specialty. OB/GYN indicates obstetrics-gynecology.

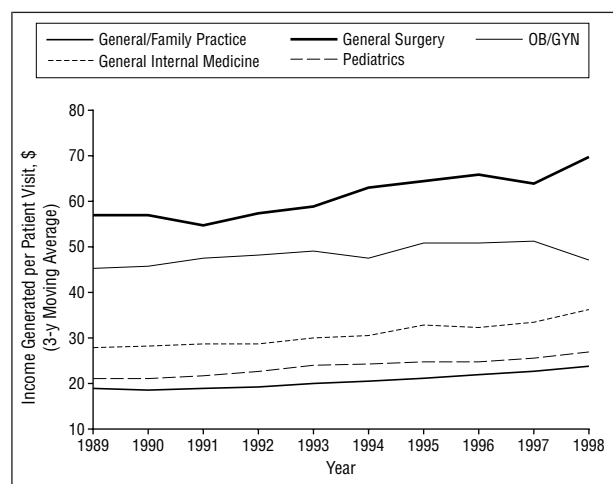


Figure 6. Income measure: 3-year moving average of the average income generated per patient visit, in 1998 dollars, by specialty. OB/GYN indicates obstetrics-gynecology.

istrative activities: the proportion of time spent in direct patient care activities did not vary over the time period examined, and the balance of professional time represents administrative efforts.

Several explanations for physician discontent remain. One explanation might be that those specialties specifically excluded in this evaluation—medical and surgical subspecialists—are experiencing a different reality, or that obstetrician-gynecologists are a particularly vocal subset of physicians. However, those specialists represent only a small proportion of the total physician population, making their concerns an unlikely explanation for overall physician discontent. Alternatively, our findings may make it clear that income, hours worked, patient volume, and time spent with patients are not relevant to current levels of physician discontent and suggest that likely explanations rest in different aspects of the quality of that work. Our measure of “working harder” was limited to the number of hours worked; physicians' work during those hours may be becoming more

complex, more managed, or otherwise less satisfying,¹⁰ or their patients may be more demanding.

Our findings have several limitations. First, they are limited by the methods of the SMS, an established survey of physicians that experienced a declining survey response rate and demonstrated substantial year-to-year variation during the time period examined. However, the results we found are consistent across the years examined, so if biases exist, they are consistent; using 3-year moving averages to smooth year-to-year variation, the trends over time are evident. Second, we were limited by the data available through that survey. Although it would have been interesting to determine whether the work done within an office visit had substantially changed over the time period examined, to assess whether clinicians were satisfied with their practices, and to obtain individual level data on clinicians so that we might understand the relationship between demographic changes and our findings, we did not have access to data that might answer these questions. To address those questions, much larger studies will be required. Third, we eliminated subspecialists from the analysis. Although an analysis of subspecialists would have been interesting, there were relatively few subspecialist respondents to the surveys, and their response rate changed year to year. Elimination of the subspecialists therefore increased our confidence in the figures that we reported for generalists. However, our study cannot be extrapolated to subspecialists of the fields examined.

Despite these limitations, our findings are provocative. They do not confirm the prevailing concern that physicians are working harder or longer, are spending less time with patients, or are experiencing declining incomes. In contrast, they suggest that physicians are maintaining incomes without changing work hours and are able to command higher reimbursement per patient visit than in the past. There is a great deal of dissatisfaction with the health care system among physicians; exploration of perceptual reasons for that dissatisfaction may outline a course of action needed to resolve it.

In conclusion, we offer the following “take-home” points:

- We used survey data to examine physicians’ concerns that they have less time to spend with their patients and that they need to work harder to maintain their incomes.
- Although the location of care shifted from the inpatient to the outpatient setting over the time period examined, we found no evidence that physicians were working longer hours, spending less time with patients, or generating lower nominal or real incomes.
- Primary care physicians showed the greatest rise in nominal and real annual income and income per hour.

Our findings suggest that more subtle perceptions of work content may account for physician dissatisfaction.

Accepted for publication July 11, 2002.

The views expressed in this article do not necessarily represent the views of the Department of Veterans Affairs or of the US government.

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