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**Value of Uncompensated Care provided by
Physicians at an Academic Medical Center
in 2007-2008 using an Opportunity Cost
Model**

**A thesis submitted to the
Yale University School of Medicine
In partial fulfillment of the Requirements for the
Degree of Doctor of Medicine**

**By
Simon Erik Laganieri**

2010

VALUE OF UNCOMPENSATED CARE PROVIDED BY PHYSICIANS AT AN ACADEMIC MEDICAL CENTER IN 2007-2008 USING AN OPPORTUNITY COST MODEL

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This project was aimed at defining, quantifying and analyzing the value of uncompensated care provided by physicians as part of the Yale Medical Group for the 2008 fiscal year. Using an opportunity cost model, uncompensated care was calculated for each department as a total of bad debt and free care and then compared to existing estimates of such care. Another aim of this study was to conduct an interdepartmental comparison of the value of such care as a percentage of departmental earnings. To undertake this study, a literature search was performed to determine previous estimates and models of uncompensated care by physicians. Primary financial data (including charges, payments and write-offs for Bad Debt and Free Care) from the Yale Medical Group for fiscal year 2008 was then collected, fed into the opportunity cost model and compared to published estimates. The results of this study showed that, as a whole, physicians at the Yale Medical Group provided \$6,510,373.65 of Uncompensated Care (or 2.75% of Total Payments) with a departmental range of 0.57%-15.29% of Total payments. These results show that Faculty physicians at Yale provided a larger amount of Uncompensated care than the published estimates obtained from random sampling of almost 4000 physicians. The results also reveal large differences in levels of uncompensated care between departments at Yale.

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Introduction

Definition of the Academic medical center (AMC)/ Academic Health Center (AHC)

Academic medical centers, by virtue of complex and evolving organization structures, are historically somewhat difficult to define and as Blumenthal et al. state in their report for the Commonwealth Fund: “definitions of an academic health center vary”¹. In their attempts to characterize and trend the changes in AMCs over time, the Commonwealth Task Force used the following working assumption: “AHCs consist of allopathic U.S. medical schools and their closely affiliated or owned educational and clinical institutions. In many cases, AHCs also include other health professional schools (public health, nursing, pharmacy, dentistry, allied health professions)”¹. Another definition used in the Journal Academic Medicine defines the AHC as: “the formal and informal interrelationships between a medical school's clinical practice, educational programs, research activities, and associated teaching hospitals”².

The exact interplay of financial and legal responsibilities and liabilities that govern the AMC's organizational framework are beyond the scope of this introduction but it is important to note that the many different models exert a set of incentives and pressures on each institution. That being said, there are a set of commonalities to AMCs that, in effect, create environments that respond to external forces in similar ways.

In fact, as stated in the Journal of Academic Medicine in 2008: “The organizational structures of academic health centers (AHCs) vary widely, but they all exist along a continuum of

integration—that is, the degree to which the academic and clinical missions operate under a single administrative and governance structure.”² In *The Academic Health Center: Evolving Organizational Models*, Wartman states that “AHCs generally fall somewhere between two extremes. At one extreme is a model of full organizational integration where the collective components of the AHC are led by a single CEO and a common overarching governing board. At the other extreme is a more loosely affiliated model in which the university academic activities, medical school physician practices, and teaching hospital operations are each managed by different leaders and governed by distinct and independent boards.”²

History of AMC

A distinct unifying feature of these large integrated medical centers is that they have a “combination of missions that include medical education and training, basic and applied research on new medical practices and technologies, and the delivery of state-of-the-art and technologically advanced patient care. For many AHCs, their mission also includes the provision of care to the poor and uninsured.”¹ The requirement to fulfill many simultaneous goals with limited resources sets up a tension between these varied missions. And as AHCs evolve and respond to external pressures, one should, in fact, expect a requisite change in the approach to each historic mission.

Mechanisms of Support

Blumenthal et al. describe the financial support mechanism of AHCs as follows: “In the past, society has relied on a complex mixture of public and private mechanisms to support the

mission-related expenses of AHCs. Public support has taken the form of explicit payments to fund biomedical research (from the National Institutes of Health and other sources), some educational expenses (from direct graduate medical education payments under Medicare and federal and state grants to support primary care and other training), and some indigent care costs (from the Medicaid disproportionate share hospital program, local subsidies, and Medicare). Other governmental support has taken the form of add-ons to Medicare and Medicaid payments (from indirect medical education at federal and state levels and the Medicare disproportionate share hospital program). Private support has for the most part taken the form of the higher prices charged private payers by AHCs; it sometimes takes the form of charitable contributions to AHCs from individuals or private foundations.”¹

As competition for limited resources increases, it would seem perhaps obvious that the most fragile or expendable AHC-related mission is the provision of care to the medically indigent. Since it constitutes a financial burden that is often cross-subsidized by funds generated by other mission-related activities (clinical and research endeavors), caring for the poor at AHCs is continuously in jeopardy. In fact, The Commonwealth Task Force states that “As we begin the new millennium, the mission of charity care is facing formidable challenges. Health care competition is reducing hospital revenues, threatening the availability of the cross-subsidies that support hospitals’ social missions, including indigent care”³. However, as the following will demonstrate, this specific mission has served not only a vital historic role but remains of great importance to the current provision of care to the un- and underinsured.

Short History of Healthcare for the Medically Indigent

“The mission of providing care to the poor goes back over 200 years to the establishment of the first teaching hospitals and medical schools in America. In 1769, Dr. Samuel Bard gave the commencement speech to the first graduating class of Kings College Medical School in New York City. Urging the establishment of a hospital, Dr. Bard laid out what he believed should be the missions of this new organization—patient care, research, and teaching. In describing the patient care mission, he said, “Let those who are at once the Victims, both of Poverty and Disease, claim your particular attention.”³As Blumenthal et al recount: “Rich and middle class patients were treated in their homes. Hospitals were to be avoided. Only the poor were left to be treated in institutions, and to provide the raw material for medical education and research. Hospitals were “charitable institutions, funded and maintained through gifts, donations, and fund-raising.”³

During the twentieth century, “both the role of hospitals and the financing of care went through major changes. Improvements in technology brought both middle and upper class patients into hospitals. Hospitals were no longer sources of care of last resort. The emergence of the health insurance industry revolutionized the financing of these institutions and the financing of care provided to the poor.”³ Specifically, “the 1965 legislation that established the Medicare and Medicaid programs provided the opportunity for faculty to bill federal and state governments for their professional services to the elderly and the poor.”⁴ No longer solely dependent on charitable giving, “AHCs and other hospitals began financing charity care through cross-subsidies from paying patients. Local governments used tax revenues to provide additional support to public hospitals”⁴.

Historically, charity care to the poor served another important function in that poor patients provided educational opportunities for the training of medical students. “Many medical schools formed loose affiliations with clinical faculty to meet the educational needs of both students and trainees, often through the provision of unreimbursed care to the poor and elderly in their associated hospitals. Until the mid-1960s, the faculty’s patient care services for these populations went unreimbursed.”⁴ As medical training and the medical insurance industry have evolved, however, this important historic agreement has not continued to play as significant a role. Combined with increasing financial pressures, the lack of direct tradeoff has further jeopardized the fulfillment of this important function.

Current changes and evolution with new pressures

In the Sept 6th 2000 article in JAMA entitled “*Academic Medicine’s Financial Accountability and Responsibility*,” Reinhardt describes the evolution of AMC-related missions. He states: “Indeed, it can be argued that the leaders of academic medicine continue to be victims of an utterly confused US public that simply cannot decide what the social role of health care should be in this country. From academic medicine, that confused public now demands the impossible, namely, that academic medicine pursue its traditional, altruistic mission of providing cutting-edge patient care, performing world-class basic and clinical research, and educating the physicians of the future after having been thrust into a harsh, price-competitive marketplace. Academic medicine is expected to play nicely in an environment where nice folks finish last”⁵.

In fact, multiple marketplace pressures have come to bear on AMCs simultaneously. In the Academic Medicine article *The Evolving Organizational Structure of Academic Health Centers: The Case of the University of Florida*, Barrett describes them as the following¹:

1. Decreases in states' general revenues to public medical schools,
2. Flattening of the National Institutes of Health budget supporting research at medical schools,
3. Reductions in reimbursement for physicians' clinical services
4. Growth in #of underinsured/uninsured

(To this list we could also add).

5. Disproportionate increase in AMC burden

The last three of these factors merit closer attention and support for these claims is presented in the following subsections.

Reductions in reimbursement for academic physician's clinical services

In the August 2006 Academic Medicine article *The Impact of the Lack of Health Insurance: How Should Academic Medical Centers and Medical Schools Respond?*, Coleman states that "Faculty in clinical departments typically face very high practice costs and are reimbursed for clinical services by insurers whose rates have not kept pace with inflation in the cost of health care. He states that "the margins of clinical practice in medical schools and AMCs

are increasingly unable to cross-subsidize the care of uninsured patients from the care of insured patients. Consequently, individual faculty and clinical departments are under increasing pressure to limit care of uninsured patients”⁶.

The drop in Medicare payments to FPPs (Faculty-Practice Plans) is due to a combination of concomitant issues. “First, beginning in 1991, Medicare implemented the resource-based relative value scale (RBRVS) for the physician work component of physician payments. This new reimbursement policy resulted in major drops in Medicare payment rates for physician specialists. As AHCs tend to have a relatively high density of specialists to support their specialty care and educational missions, FPPs faced a decrease in Medicare payments”³. Medicare has also “implemented new rules restricting the circumstances under which teaching physicians may bill for services. Thus, while AHC hospitals providing disproportionate amounts of care to the poor continue to receive additional support from Medicare and Medicaid, the revenues of FPPs from the public plans have been falling”³.

Growth in #of underinsured/uninsured

As financial pressures mount and supply of possible charity care decreases, the concomitant increase in the amount of medically-indigent patients and thus the demand for charity services is increasing. According to the Kaiser Family Foundation report on the uninsured in America in 2004, “there are nearly 44 million Americans without health insurance coverage... and the number of uninsured Americans continues to grow”⁷. This well documented trend continued in the subsequent years. In fact, the number of non-elderly Americans who lack health insurance continues to rise by approximately 1 million per year, climbing to 45.6 million

in 2005 and 47 million in 2006⁸. When one considers the lack of universal health care or increase in even partial insurance coverage, this number is surely expected to continue growing in the coming years and to exert even more pressure on the current safety net for the uninsured.

Disproportionate increase in AMC burden

As the demand for charitable services is growing, the burden continues to fall disproportionately on AMCs and faculty physicians. Many centers are located in close proximity to disadvantaged neighborhoods, are historically tied to the care of the medically indigent and are required by law (EMTALA laws of 1986) to screen and treat any unstable patient that enters the hospital. AMCs are also often the only tertiary center for patients with specific needs (for example burn victims)⁹. One small example of this fact is described by Sheffield et al. in their description of the mission of the Harborview Medical Center in Seattle WA. "Total revenue [at Harborview Medical Center] in 2005 was \$506 million and income exceeded expenditures by \$8.1 million (a 1.6% margin). UWSOM faculty and staff based at Harborview provided \$98 million in charity care during the year, which accounted for more than one-third of all charity care in the state."⁹

Another factor contributing to the burden at AMCs is inter-hospital transfers of complicated uninsured inpatients. In *The Relationship of Insurance Status, Hospital Ownership, and Teaching Status with Inter-hospital Transfers in California in 2000*, the authors determined that County-owned hospitals and University of California teaching hospitals appear to have received more patients whose primary reason for transfer may have been financial than did other hospital groups¹⁰.

Results of Financial Pressures

The result of these many pressures is a predictable overall integrated focus towards sustainability and profitability. Leadership and administrators (at both the hospital and faculty practice plans) are obliged to confront these realities and readjust their priorities. However, since Hospitals and Faculty Physicians respond to different pressures and operate in a different legal environment, the strategies used to manage these issues differ and have different outcomes on the care of the medically indigent. As stated by Dr. Cohen, president of the AAMC in 2000, “Many circumstances are coming together to place unprecedented pressure on the nation’s health care safety net.”¹¹

Compensatory/offsetting strategies for AMCs

Government subsidies to Hospitals

Compensation for the treatment of the uninsured is achieved by government subsidies to hospitals through its Medicare and Medicaid payments. “Medicaid has two major programs that help fund the cost of hospital uncompensated care: DSH payments and supplemental payment programs. These programs also offset low Medicaid reimbursement rates in hospitals that receive DSH payments. Medicaid DSH payments support both hospitals and long-term care facilities that treat large numbers of poor patients. Medicare subsidizes uncompensated care through its Medicare DSH payments and indirect medical education (IME) hospital payments. Medicare’s DSH adjustment is applied to the payment rate for hospitals that treat a large number of poor patients”³.

Limiting access to care, Increasing collections

Depending on ownership status of the hospital (for-profit, not-for-profit and public), certain compensatory strategies have already been adopted. In *Managing the Unmanaged*, Weiner et al. undertook the analysis of how 3 urban medical centers with differing ownership models, within 1 metropolitan area, ration access to uncompensated care to uninsured patients. They found that the public institution “provided the broadest access to the largest percentage of self-pay patients but offset the burden with the most successful prepayment and collection practices. The for-profit site obeyed federal regulations mandating emergency care but severely curtailed non-ED services (referring to other institutions), and the not-for-profit limited access (but not to the extent of the for-profit) and pursued collection (but not to the extent of the public)”¹².

Compensatory strategies specific to physicians

Importance of physician’s role in medical center

The importance of physicians to the care of low-income persons is demonstrated by the fact that roughly “one-third of uninsured persons and 58 percent of Medicaid enrollees report that a physician’s office is the place where they usually receive medical care, a higher percentage than that reported for both health centers and hospital-based facilities (unpublished estimates from the 2003 Community Tracking Study Household Survey)”⁸.

Physicians refuse care for Uninsured and Medicaid

However, “physicians are not legally obligated to care for Medicaid recipients or the uninsured, and most doctors limit such care, although the American Medical Association (AMA) emphasizes that physicians should render medical services to indigent patients and tend to the welfare of the community”⁸.

Given the importance of physicians as a source of care for low-income uninsured and Medicaid enrollees, Cunningham et al. state that “policymakers should be concerned about recent trend data from the Community Tracking Study Physician Survey showing that the number of physicians providing charity care and accepting Medicaid patients has been decreasing since the mid-1990s”¹³. The percentage of physicians providing any charity care has fallen fairly substantially, from 76.3 percent in 1996/1997 to 68.2 percent in 2004/2005. Also, a growing number of physicians derive no revenue from Medicaid and are not accepting new Medicaid patients, although the change between 1996/1997 and 2004/2005 has not been as great as that for physicians’ charity care.

Lack of DSH-type payments to support Physician practices?

Given the important role played by physicians (and especially faculty physicians) in the provision of care to the medically indigent, it is noteworthy that no direct government subsidy directly supports their efforts. As noted by Barrett: “Government programs have subsidized hospitals treating a disproportionate amount of poor patients (e.g., the disproportionate share hospital payment adjustment and Medicare’s indirect medical education adjustment); however,

these programs have not included physicians. Further, emergency physician groups do not have other business units or sources of revenue to subsidize high levels of uncompensated care costs”².

Blumenthal et al. describe the situation as follows: “Faculty Physician Practices do not receive the financial consideration from government for their clinical services that hospitals do. AHC hospitals are eligible for significant payment adjustments from Medicare and Medicaid to support the cost of their care to the poor and uninsured. Medicare and Medicaid disproportionate share policies provide substantial funding for hospitals with an unusually high volume of care to poor Medicare and Medicaid patients. Yet, neither public plan offers comparable support to physicians and faculty practice plans. In fact, Medicare and Medicaid payments for physician services have been falling. On an inflation-adjusted basis, FPP Medicare revenues fell by nearly 10 percent (9.8%) from 1995 to 1998; Medicaid patient revenues were down 15.2 percent”³.

Adjustments in compensation plans to prioritize financial sustainability

Academic departments have supported their faculty in clinical, research, and teaching areas in the past; nonetheless, due to economic trends in the healthcare environment, this has created a challenge to departments based at academic medical centers. In the past, excess revenue was used to support teaching and research, however; with the decrease in reimbursement and increase in documentation, this is no longer possible. Because of these changes, academic healthcare organizations are focusing now, more than ever before, on their physician compensation plans as most practices in integrated healthcare systems are having difficulty meeting their salaries and overhead”¹³.

According to Rimar in *Strategic Planning and the Balanced Scorecard for Faculty Practice Plans* “strategic planning is critical for faculty practice plans since they are, in many ways, more vulnerable to competition than the other components of AHCs. Without financial reserves or government subsidies, practice plans must pay for their entire operations from clinical revenues”¹⁴.

Financial Incentive structures

Given the need for sustainable faculty practices, compensation plans now center around the benchmarking of clinical performance. Strategies to maximize earnings entail focusing on variables such as gross charges, collections, net charges and work relative value units (wRVUs). The following provides short definitions.

Gross Charges: Gross charges are a simple reflection of actual practice activities. However, the disadvantage is that they do not accurately reflect the actual collections from patients and payers.

Collections (Payments): Collections reflect money actually received. Establishing physician bonuses, however, on collections can penalize the physicians that service the medically indigent.

Net Charges: Net Charges are gross charges minus contractual adjustments. This method can also cause physicians to get more or less credit for their work based on the reimbursement of the payers.

Work Relative Value Units (wRVUs): Work RVUs measure the clinical effort of the provider and are linked to the current procedural terminology (CPT) codes. Activity can be compared with other practices across the country. The advantage of wRVUs is that it does not rely on payer mix, collection ratios, or use of laboratories.¹³

Results of Overall Strategies

As faculty plans become more sophisticated at maximizing earnings potential, the pressure to curtail non-profitable endeavors such as charity care increases significantly. Coleman describes the current situation in Academic Medicine in 2006 as follows: “Faculty in clinical departments typically face very high practice costs and are reimbursed for clinical services by insurers whose rates have not kept pace with inflation in the cost of health care. Accordingly, the margins of clinical practice in medical schools and AMCs are increasingly unable to cross-subsidize the care of uninsured patients from the care of insured patients. Consequently, individual faculty and clinical departments are under increasing pressure to limit care of uninsured patients.”⁶

Need to quantify social mission, value of charity care

Given the current trends and the impact on charity care, proper accounting and trending of the amounts of uncompensated care is important. This is especially true at Academic Medical Centers where a significant portion of this care is provided. In their analysis as part of the Task Force for The Commonwealth Fund, Blumenthal et al recommended that “AHCs and

public authorities must develop improved information on the content and amounts of mission-related activities undertaken at AHCs". Specifically, they recommend that "1-Government at all levels should invest in research and development necessary to develop valid and reliable measures of performance in mission-related areas and 2- Data on the quantity, quality, and productivity of mission-related activities and their associated clinical expenses at institutions seeking public support for those expenses should be publicly available."¹

Previous Attempts to Model Free Care (Methods of tabulating/ calculating)

Several states have enacted laws which define a minimum level of charity care that non-profit hospitals must provide in order to retain their tax-exempt status. "In Texas, for example, hospitals must document that they're providing charity care equal to 4% of the hospital's patient revenue, excluding bad debt"¹⁵.

In the preceding decades, although the AMA has performed yearly surveys to calculate free and discounted care at hospitals, few studies have actually attempted to calculate the "quantity, quality, and productivity" of uncompensated care by physicians¹⁵. As stated by Hadley and Holahan in Health Affairs in 2003, "no single data source provides complete unambiguous and precise information"¹⁶. Previous attempts have centered on the use of self-reported surveys of patients and physicians.

Community-tracking study (Cunningham et al.)

CTS is a nationally representative telephone survey of physicians involved in direct care in the continental U.S. This survey asked physicians about the share of patients who receive free or reduced price care due to financial need (but without distinguishing insured versus

uninsured), and the percentage of practice time spent providing such care. The most recent round of this study (2004–2005) found that 68.2% of physicians provide such “charity care”, and that, among physicians providing such care, it amounts to 6.3% of their time¹⁷.

Medical Expenditure Panel Survey (MEPS)

This approach uses household survey data collected by the Medical Expenditure Panel Survey (MEPS). MEPS obtains information on services used from household respondents and then contacts providers to identify amounts and sources of payment for the respondents’ care.

AMA Socioeconomic Monitoring System

An analysis of data from the American Medical Association’s (AMA’s) 1994 Socioeconomic Monitoring System found that “67.7 percent of physicians provided some uncompensated care and that those physicians spent an average of 7.2 hours per week delivering that care. Using an estimate (from the same study) of physicians’ average gross earnings per hour of \$105 and inflating to 2001 prices produces an estimate of \$9.1 billion in uncompensated care delivered by physicians”¹⁵.

Drawbacks to using survey data

One important consideration with the use of survey data are the confounders. Inherent in self-reported accounting of care is recall bias and a propensity to overestimate donated time. Thus, the lack of primary financial data creates difficulty in valuing and trending the amount of care actually provided.

However, the attempt to use financial data to value physician activities also presents challenges. For example, how does one value a physician's time and which values should be used: net charges, collections or RVUs? Since reimbursements are largely dictated by Medicare, Medicaid and the rates negotiated with private insurance companies, no single "value" exists for each billable physician activity.

One result of this differential billing system is in fact the paradoxically higher charges faced by non-insured or self-pay patients. In fact, as reported in *Medical Fees Are Often Higher For Patients Without Insurance*, "... the uninsured are outside of the system and have no one to negotiate for them. So they end up charged the higher prices"¹⁸. The result of ongoing negotiated payments discounts by large insurer groups and government entities results in very inflated non-negotiated charges on which they apply the discount.

Without the support of such entities, self-pay patients as a whole are charged substantially higher rates. Even with personally discounted rates including complete write-offs (when patients are deemed indigent by virtue of limited resources), self-pay patients as a whole generate a significant stream of revenue (even if a significant portion of these self-pay patients aren't able to pay anything).

Valuing free time as Opportunity Costs

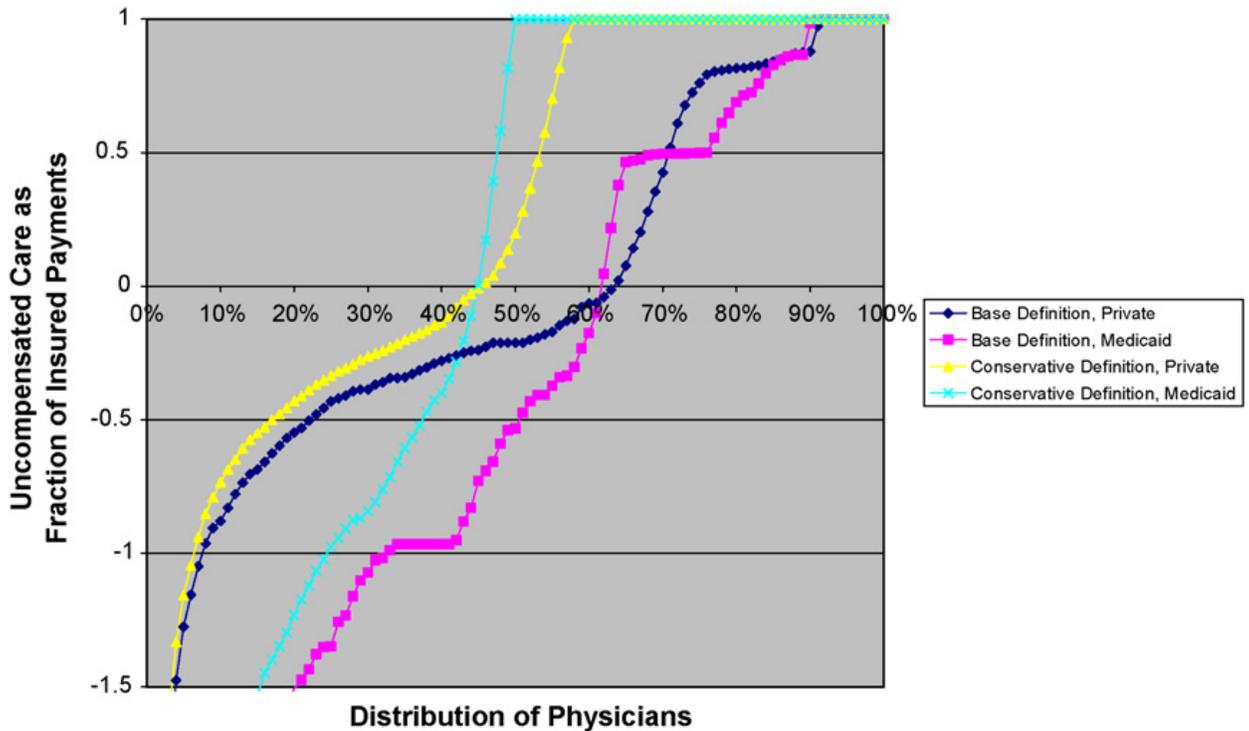
In the article *How much Uncompensated Care do doctor's provide?*, Gruber attempted to get at this apparent paradox by valuing physician donated time as the amount they were forgoing by seeing an indigent patient instead of a paying patient. They stated that: "The magnitude of provider uncompensated care has become an important public policy issue. Yet existing measures of uncompensated care are flawed because they compare uninsured

payments to list prices, not to the prices actually paid by the insured.”¹⁵ In their attempt, they used financial data from almost 4000 physicians from all types of practices (private, groups and faculty), and measured “uncompensated care as the net amount that physicians lose by lower *payments* from the uninsured than from the insured.”¹⁵

This approach “implicitly asks the question: if each provider could replace each uninsured patient with an insured patient who received the same level of care, would the provider expect to make more or less? If the uninsured patient paid the same amount the average insurance company would pay (to the same doctor, for the same procedure), then we say there is no uncompensated care.”¹⁵

The results from this approach were surprising. Gruber and Rodriguez essentially found “that physicians [as a whole] provide *negative* uncompensated care to the uninsured, earning more on uninsured patients than on insured patients with comparable treatments.”¹⁵

These results counter the more commonly held view about physician charity. In their article, however, the distribution of charity care was of course not distributed evenly among different physicians. While overall physicians were providing limited or negative amounts of care in terms of value as opportunity cost, some physicians were providing quite a lot of uncompensated care.



Gruber and Rodriguez, How much uncompensated care do doctor's provide?, Journal of Health Economics 2007

Where do faculty physicians fall on this spectrum?

The value of uncompensated care generated by Academic faculty physicians within the above distribution is unknown but likely quite high and thus of great interest in quantifying and following over time. This is especially true when considering the disproportionately large proportion of uncompensated care being provided in AMCs and thus the large potential impact of a change in physician behavior regarding uncompensated care.

Since these values (based on this approach) are largely unknown and/or unpublished in academic faculty practices, calculating the data based on the financial data for one fiscal year at one academic practice is a reasonable starting point for further comparisons.

Statement of purpose specific hypothesis and specific aims of thesis:

- To measure the amount of “uncompensated care” provided to medically indigent patients by Faculty at an Academic Medical Center in terms of an opportunity cost model.
- To determine the value of uncompensated care by department
- To compare the values obtained in this study to current estimates of uncompensated care

Methods:

Literature search for current understanding and valuation of care provided by academic physicians

OVID Medline was searched for any article reporting on uncompensated care at academic medical centers using the following parameters:

Results Generated From:

Ovid MEDLINE(R) <1950 to June Week 1 2009>

Ovid MEDLINE(R) <2005 to June Week 1 2009> (updates since 2009-06-01)

Set	Search	Results #Articles
001	medically uninsured.mp. or exp Medically Uninsured/	1428
002	medical indigency.mp. or exp Medical Indigency/	112
003	uncompensated care.mp. or exp Uncompensated Care/	462
004	self pay.mp.	79
005	1 or 2 or 3 or 4	1929
006	exp Faculty, Medical/	1530
007	exp Academic Medical Centers/	11246
008	((academic or faculty or medical) adj2 (practice or group or plan)).tw.	3004
009	8 or 6 or 7	15026
010	9 and 5	41
011	reimbursement.mp. or exp Reimbursement, Disproportionate Share/ or exp Insurance, Health, Reimbursement/ or exp Reimbursement Mechanisms/ or exp Reimbursement, Incentive/	6845
012	11 and 10	5
013	Health services accessibility.mp. or exp Health Services Accessibility/	15477
014	13 and 10	9
015	exp Schools, Medical/	2278
016	10 and 15	6
017	exp Physician's Practice Patterns/	11175
018	10 and 17	0
019	exp Group Practice/ or exp Practice Management/ or exp Practice Management, Medical/	5609
020	19 and 10	2
021	exp Fees, Medical/	299
022	21 and 10	0
023	exp Employee Incentive Plans/	175
024	23 and 10	0
025	physician incentive plan.mp. or exp Physician Incentive Plan	469
026	25 and 10	0
027	26 or 12 or 20 or 14 or 22 or 18 or 24 or 16	17
028	27 or 10	41
029	Uncompensated Care Provided by.m_titl.	1
030	medically uninsured.mp. or exp Medically Uninsured/	1428

031	medical indigency.mp. or exp Medical Indigency/	112
032	uncompensated care.mp. or exp Uncompensated Care/	462
033	self pay.mp.	79
034	30 or 31 or 32 or 33	1929
035	exp Faculty, Medical/	1530
036	exp Academic Medical Centers/	11246
037	((academic or faculty or medical) adj2 (practice or group or plan)).tw.	3004
038	37 or 35 or 36	15026
039	38 and 34	41
040	reimbursement.mp. or exp Reimbursement, Disproportionate Share/ or exp Insurance, Health, Reimbursement/ or exp Reimbursement Mechanisms/ or exp Reimbursement, Incentive/	6845
041	40 and 39	5
042	Health services accessibility.mp. or exp Health Services Accessibility/	15477
043	42 and 39	9
044	exp Schools, Medical/	2278
045	39 and 44	6
046	exp Physician's Practice Patterns/	11175
047	39 and 46	0
048	exp Group Practice/ or exp Practice Management/ or exp Practice Management, Medical/	5609
049	48 and 39	2
050	exp Fees, Medical/	299
051	50 and 39	0
052	exp Employee Incentive Plans/	175
053	52 and 39	0
054	physician incentive plan.mp. or exp Physician Incentive Plan	469
055	54 and 39	0
056	55 or 41 or 49 or 43 or 51 or 47 or 53 or 45	17
057	56 or 39	41
058	exp Physicians/	11899
059	58 or 38	26181
060	34 and 59	76

Financial Data mining of primary financial data from Yale Medical Group financial services

The information about uncompensated care at YMG was pulled from Precision Business Intelligence (PBI), the business analytical tool utilized to analyze and report data. Data from the IDX/GE Centricity financial system is extracted nightly through Global Works.

BAR is the Billing and Accounts Receivable application that maintains the complete accounting of all patient financial activity. The queries were based on transaction level information from BAR.

Data for Free Care Write-Offs for FY2008 was sorted by department and includes any invoice that had Free Care paycodes listed below, and the total charges, units, and payments posted on that invoice. Data for Bad Debt Write-Offs for FY2008 was sorted by department and includes

any invoice that had Bad Debt paycodes listed below, and the total charges, units, and payments posted on that invoice.

The following paycodes as Free Care and Bad Debt were used to determine the amount of uncompensated financial services -

1) Free Care

- * FINANCIAL HARDSHIP DISCOUNT
- * FINANCIAL HARDSHIP FEDERAL POVERTY GUIDELINES
- * MAMO CHARITY DISCOUNT
- * PHYSICIAN DETERMINED FINANCIAL HARDSHIP
- * YDR CHARITY WRITEOFF
- * PROFESSIONAL COURTESY DISCOUNT
- * ANESTHESIA/SURG RESIDENT COSMETIC DISCOUNT
- * INTL SVC FREE CARE DISCOUNT
- * CITY WELFARE NH ADJ

2) Bad Debt

- * BANKRUPTCY
- * DECEASED PT-NO ESTATE ADJ
- * PETER ROBERTS AND ASSOC WRITE-OFF
- * TRANS CONTINENTAL WRITE-OFF
- * SMALL BALANCE ADJ

Approach to calculation of Uncompensated Care

Formula Free Care for each department for each year:

$\{(Total\ payments/total\ charges) * total\ Free\ Care\ Charges\} - Actual\ payments\ from\ Free\ Care\ accounts$

Formula Bad debt for each department for each year:

$\{(Total\ payments/total\ charges) * total\ Bad\ debt\ Charges\} - Actual\ payments\ from\ Bad\ Debt\ accounts$

Total Uncompensated Care = Free Care + Bad Debt

Example:

Three patients are each billed 1000\$ for the same procedure by a physician under Yale Medical Group. The first patient is privately insured and the negotiated rate is 200\$, the second has Medicare and the rate is 100\$ and the third has Medicaid with a rate of 50\$. The average rate of payment for an insured patient for this procedure is thus $(200+100+50/3*1000) = 11.6\%$.

If a patient is uninsured and billed 1000\$ for the same procedure, they will probably receive a discount or simply not pay (or both). However, the average uninsured patient will pay something and YMG will receive that amount. For example, the average amount received for this procedure could be 56\$ for uninsured patients.

The opportunity cost, (assuming an endless supply of insured patient) of seeing an uninsured patient instead of an insured patient in this scenario would be $\{(1000 * 11.6\%)\} - 56\$ = 60\$$. Thus there is a 60\$ “uncompensated care opportunity cost” for every uninsured individual undergoing this procedure.

Results:

Table 1: Fiscal Year 2008 Total Charges with calculated % reimbursements

Department	Charges	Payments	Corrected Charges (Total - Uncomp)	Corrected Payments (Total - Uncomp)	% Reimbursement (of Corrected Charges)
ANESTHESIOLOGY	\$86,340,161	\$30,814,569	\$82,465,342	\$30,066,959	36.46
CHILD STUDY CENTER	\$4,067,182	\$3,080,599	\$3,977,947	\$3,055,423	76.81
DERMATOLOGY	\$35,155,105	\$20,106,339	\$34,070,532	\$19,713,614	57.86
DERMATOPATHOLOGY LAB	\$813,713	\$597,509	\$786,327	\$584,673	74.36
DIAGNOSTIC RADIOLOGY	\$45,289,045	\$15,915,781	\$41,959,718	\$15,365,275	36.62
GENETICS	\$6,241,977	\$2,576,160	\$5,964,065	\$2,480,663	41.59
INTERNAL MEDICINE	\$82,627,369	\$26,562,646	\$77,093,326	\$25,505,855	33.08
LABORATORY MEDICINE	\$2,691,160	\$809,028	\$2,551,744	\$790,562	30.98
NEUROLOGY	\$7,050,972	\$2,619,401	\$6,686,163	\$2,547,631	38.10
NEUROSURGERY	\$17,060,834	\$4,903,132	\$16,389,247	\$4,738,692	28.91
OB/GYN	\$49,603,859	\$20,871,263	\$47,727,321	\$20,353,000	42.64
OPHTHALMOLOGY	\$14,270,012	\$4,750,649	\$13,399,894	\$4,546,797	33.93
ORTHOPAEDICS	\$28,396,267	\$9,760,040	\$26,979,111	\$9,455,522	35.05
PATHOLOGY	\$48,362,457	\$23,458,338	\$46,417,049	\$22,945,207	49.43
PEDIATRICS	\$50,471,996	\$17,746,371	\$48,752,304	\$17,240,121	35.36
PSYCHIATRY	\$2,707,367	\$763,004	\$2,303,332	\$695,015	30.17
SURGERY	\$85,821,866	\$28,547,223	\$81,432,580	\$27,728,397	34.05
SURGERY EMERGENCY MEDICINE	\$28,715,996	\$9,620,727	\$24,037,206	\$9,284,817	38.63
THERAPEUTIC RADIOLOGY	\$20,794,785	\$7,606,242	\$20,064,968	\$7,493,949	37.35
YALE CANCER CENTER	\$10,024,286	\$5,289,834	\$9,379,091	\$5,102,379	54.40
Totals	\$627,873,637	\$236,911,667	\$593,778,972	\$230,203,788	38.77

Table 2: Fiscal Year 2008 Medicaid Charges with calculated % reimbursements

Department	Medicaid Charges	Medicaid Payments	Corrected Charges (Total - Uncomp)	Corrected Charges - Medicaid	Corrected Payments (Total - Uncomp)	Corrected Payments - Medicaid	% Reimb. Corrected Charge s)	%Reim b. Medicaid
ANESTHE-SIOLOGY	\$12,011,917	\$1,274,903.45	\$82,465,342	\$70,453,425	\$30,066,959	\$28,792,056	36.46	40.87
CHILD STUDY CENTER	\$2,526,300	\$1,944,500.32	\$3,977,947	\$1,451,647	\$3,055,423	\$1,110,923	76.81	76.53
DERMATOLOGY	\$296,703	\$58,522.80	\$34,070,532	\$33,773,829	\$19,713,614	\$19,655,091	57.86	58.20
DERMATOPATH- OLOGY LAB	\$5,188	\$4,588.41	\$786,327	\$781,139	\$584,673	\$580,085	74.36	74.26
DIAGNOSTIC RADIOLOGY	\$5,958,674	\$1,529,988.50	\$41,959,718	\$36,001,044	\$15,365,275	\$13,835,287	36.62	38.43
GENETICS	\$1,045,202	\$236,548.80	\$5,964,065	\$4,918,863	\$2,480,663	\$2,244,114	41.59	45.62
INTERNAL MEDICINE	\$9,735,152	\$1,706,899.22	\$77,093,326	\$67,358,174	\$25,505,855	\$23,798,956	33.08	35.33
LABORATORY MEDICINE	\$356,168	\$46,512.07	\$2,551,744	\$2,195,576	\$790,562	\$744,050	30.98	33.89
NEUROLOGY	\$1,060,056	\$172,201.67	\$6,686,163	\$5,626,107	\$2,547,631	\$2,375,429	38.1	42.22
NEURO-SURGERY	\$2,814,390	\$327,504.56	\$16,389,247	\$13,574,857	\$4,738,692	\$4,411,187	28.91	32.50
OB/GYN	\$10,678,841	\$2,988,945.78	\$47,727,321	\$37,048,480	\$20,353,000	\$17,364,054	42.64	46.87
OPHTHAL-MOLOGY	\$2,728,861	\$397,534.82	\$13,399,894	\$10,671,033	\$4,546,797	\$4,149,262	33.93	38.88
ORTHOPAEDICS	\$2,829,343	\$393,585.60	\$26,979,111	\$24,149,768	\$9,455,522	\$9,061,936	35.05	37.52
PATHOLOGY	\$3,153,417	\$596,035.50	\$46,417,049	\$43,263,632	\$22,945,207	\$22,349,172	49.43	51.66
PEDIATRICS	\$21,453,552	\$3,978,355.01	\$48,752,304	\$27,298,752	\$17,240,121	\$13,261,766	35.36	48.58
PSYCHIATRY	\$891,790	\$176,454.16	\$2,303,332	\$1,411,542	\$695,015	\$518,561	30.17	36.74
SURGERY	\$13,614,661	\$1,974,710.11	\$81,432,580	\$67,817,919	\$27,728,397	\$25,753,687	34.05	37.97
SURGERY EMERGENCY MEDICINE	\$6,744,143	\$1,038,933.94	\$24,037,206	\$17,293,063	\$9,284,817	\$8,245,883	38.63	47.68
THERAPEUTIC RADIOLOGY	\$1,135,158	\$185,102.24	\$20,064,968	\$18,929,810	\$7,493,949	\$7,308,847	37.35	38.61
YALE CANCER CENTER	\$652,405	\$131,764.43	\$9,379,091	\$8,726,686	\$5,102,379	\$4,970,615	54.4	56.96
Totals	\$100,672,266	\$19,546,999	\$593,778,972	\$493,106,706	\$230,203,788	\$210,656,789	38.77	42.72

Table 3 : Fiscal Year 2008 Uncompensated Care generated from outstanding “Bad Debt” Accounts per department

Department	Charges	Units	Payments	Write-off's	Expected Reimbursement (based on % Reimbursement)	Expected Reimbursement (Medicaid Adjust)	Uncompensated care (expected Reimb - Payments)	Uncompensated care (Medicaid Adjust)
ANESTHESIOLOGY	\$2,812,016	19,264	\$655,642	\$1,048,738	\$1,025,264	\$1,149,181	\$369,622	\$493,539
CHILD STUDY CENTER	\$41,855	355	\$4,686	\$34,077	\$32,148	\$32,031	\$27,462	\$27,345
DERMATOLOGY	\$731,553	3,106	\$345,390	\$175,450	\$423,285	\$425,736	\$77,895	\$80,346
DERMATOPATHOLOGY LAB	\$24,740	156	\$12,143	\$9,416	\$18,395	\$18,372	\$6,252	\$6,229
DIAGNOSTIC RADIOLOGY	\$2,323,143	22,982	\$528,145	\$811,406	\$850,714	\$892,789	\$322,570	\$364,645
GENETICS	\$252,450	1,155	\$92,925	\$69,008	\$105,003	\$115,174	\$12,077	\$22,249
INTERNAL MEDICINE	\$3,901,268	14,124	\$1,013,076	\$1,253,776	\$1,290,711	\$1,378,394	\$277,634	\$365,318
LABORATORY MEDICINE	\$100,902	673	\$17,797	\$33,200	\$31,261	\$34,194	\$13,464	\$16,397
NEUROLOGY	\$259,155	2,450	\$69,591	\$89,629	\$98,746	\$109,419	\$29,154	\$39,828
NEURO-SURGERY	\$514,923	695	\$131,412	\$122,886	\$148,882	\$167,326	\$17,470	\$35,914
OB/GYN	\$1,600,452	4,438	\$480,793	\$529,072	\$682,502	\$750,107	\$201,710	\$269,315
OPHTHALMOLOGY	\$650,897	1,746	\$187,499	\$192,893	\$220,860	\$253,091	\$33,360	\$65,592
ORTHOPAEDICS	\$1,073,007	2,522	\$295,411	\$361,099	\$376,063	\$402,634	\$80,652	\$107,223
PATHOLOGY	\$1,657,914	10,164	\$493,386	\$649,253	\$819,552	\$856,447	\$326,166	\$363,061
PEDIATRICS	\$1,569,402	5,901	\$490,260	\$551,566	\$554,983	\$762,417	\$64,723	\$272,157
PSYCHIATRY	\$279,345	1,470	\$39,972	\$165,982	\$84,290	\$102,623	\$44,319	\$62,652
SURGERY	\$2,865,354	5,379	\$743,358	\$1,086,455	\$975,674	\$1,088,111	\$232,316	\$344,753
SURGERY EMERGENCY MEDICINE	\$3,152,498	12,308	\$320,589	\$2,437,744	\$1,217,711	\$1,503,211	\$897,122	\$1,182,622
THERAPEUTIC RADIOLOGY	\$413,089	996	\$104,176	\$102,327	\$154,282	\$159,495	\$50,106	\$55,319
YALE CANCER CENTER	\$472,555	1,710	\$175,747	\$117,286	\$257,078	\$269,162	\$81,331	\$93,415
Totals	\$24,717,685	111,673	\$6,205,523	\$9,855,353	\$9,582,866	\$10,559,475	\$3,377,343	\$4,353,952

Bad Debt Financial Categories include:

- BANKRUPTCY
- DECEASED PT-NO ESTATE ADJ
- PETER ROBERTS AND ASSOC WRITE-OFF
- TRANS CONTINENTAL WRITE-OFF
- SMALL BALANCE ADJ

Table 4: Fiscal Year 2008 Uncompensated Care generated from outstanding “Free Care” Accounts per department

Department	Charges	Payments	Write-off's	Expected Reimbursement (based on % Reimbursement)	Expected Reimbursement (Medicaid Adjust)	Uncompensated care	Uncompensated Care (Medicaid Adjust)
ANESTHESIOLOGY	\$1,062,803	\$91,968	\$952,263	\$387,499.20	\$434,333.50	\$295,531.41	\$342,365.71
CHILD STUDY CENTER	\$47,380	\$20,490	\$26,374	\$36,392.12	\$36,259.17	\$15,901.90	\$15,768.95
DERMATOLOGY	\$353,020	\$47,335	\$267,016	\$204,261.56	\$205,444.29	\$156,926.70	\$158,109.43
DERMATOPATHOLOGY LAB	\$2,646	\$692	\$1,701	\$1,967.43	\$1,964.96	\$1,275.14	\$1,272.67
DIAGNOSTIC RADIOLOGY	\$1,006,184	\$22,362	\$938,376	\$368,455.61	\$386,678.89	\$346,093.88	\$364,317.16
GENETICS	\$25,462	\$2,572	\$21,342	\$10,590.54	\$11,616.43	\$8,018.90	\$9,044.79
INTERNAL MEDICINE	\$1,632,775	\$43,715	\$1,484,885	\$540,193.61	\$576,891.23	\$496,478.40	\$533,176.02
LABORATORY MEDICINE	\$38,514	\$669	\$36,451	\$11,932.11	\$13,051.85	\$11,262.82	\$12,382.56
NEUROLOGY	\$105,654	\$2,178	\$99,360	\$40,257.39	\$44,608.75	\$38,079.02	\$42,430.38
NEUROSURGERY	\$156,664	\$33,028	\$118,128	\$45,296.93	\$50,908.40	\$12,269.29	\$17,880.76
OB/GYN	\$276,086	\$37,470	\$197,421	\$117,735.05	\$129,397.28	\$80,265.02	\$91,927.25
OPHTHALMOLOGY	\$219,222	\$16,352	\$189,786	\$74,385.52	\$85,241.00	\$58,033.29	\$68,888.77
ORTHO-PAEDICS	\$344,149	\$9,107	\$317,679	\$120,615.85	\$129,138.15	\$111,509.12	\$120,031.42
PATHOLOGY	\$287,494	\$19,746	\$247,064	\$142,116.08	\$148,513.95	\$122,370.55	\$128,768.42
PEDIATRICS	\$150,290	\$15,990	\$123,720	\$53,146.57	\$73,011.06	\$37,156.99	\$57,021.48
PSYCHIATRY	\$124,690	\$28,018	\$70,545	\$37,624.35	\$45,807.60	\$9,606.79	\$17,790.04
SURGERY	\$1,523,932	\$75,468	\$1,326,546	\$518,910.27	\$578,709.56	\$443,441.86	\$503,241.15
SURGERY EMERGENCY MEDICINE	\$1,526,292	\$15,321	\$1,464,778	\$589,558.60	\$727,784.62	\$574,237.88	\$712,463.90
THERAPEUTIC RADIOLOGY	\$316,728	\$8,117	\$276,833	\$118,292.91	\$122,289.47	\$110,176.14	\$114,172.70
YALE CANCER CENTER	\$172,640	\$11,709	\$145,839	\$93,918.98	\$98,333.65	\$82,210.29	\$86,624.96
Totals	\$9,376,980	\$502,357	\$8,310,236	\$3,635,387	\$4,005,876	\$3,133,030	\$3,503,519

Free Care Financial Categories include:

- FINANCIAL HARDSHIP DISCOUNT
- FINANCIAL HARDSHIP FEDERAL POVERTY GUIDELINES
- MAMO CHARITY DISCOUNT
- PHYSICIAN DETERMINED FINANCIAL HARDSHIP
- YDR CHARITY WRITEOFF
- PROFESSIONAL COURTESY DISCOUNT
- ANESTHESIA/SURG RESIDENT COSMETIC DISCOUNT
- INTL SVC FREE CARE DISCOUNT

Table 5: Fiscal Year 2008 Total Uncompensated Care as a % of total payments per department

Department	Total Amount	Total Amount (Medicaid Adjustment)	% of Payments	%Payments (Medicaid Adjustment)
ANESTHESIOLOGY	\$665,153.87	\$835,904.65	2.16	2.71
CHILD STUDY CENTER	\$43,364.24	\$43,113.84	1.41	1.40
DERMATOLOGY	\$234,821.88	\$238,455.53	1.17	1.19
DERMATOPATHOLOGY LAB	\$7,527.60	\$7,501.96	1.26	1.26
DIAGNOSTIC RADIOLOGY	\$668,663.46	\$728,961.85	4.20	4.58
GENETICS	\$20,096.35	\$31,293.78	0.78	1.21
INTERNAL MEDICINE	\$774,112.56	\$898,493.57	2.91	3.38
LABORATORY MEDICINE	\$24,726.36	\$28,779.70	3.06	3.56
NEUROLOGY	\$67,233.51	\$82,258.19	2.57	3.14
NEUROSURGERY	\$29,739.26	\$53,794.53	0.61	1.10
OB/GYN	\$281,974.54	\$361,241.91	1.35	1.73
OPHTHALMOLOGY	\$91,393.70	\$134,480.44	1.92	2.83
ORTHOPAEDICS	\$192,160.74	\$227,254.35	1.97	2.33
PATHOLOGY	\$448,536.39	\$491,829.29	1.91	2.10
PEDIATRICS	\$101,879.58	\$329,178.81	0.57	1.85
PSYCHIATRY	\$53,925.63	\$80,441.94	7.07	10.54
SURGERY	\$675,758.14	\$847,994.25	2.37	2.97
SURGERY EMERGENCY MEDICINE	\$1,471,359.49	\$1,895,086.10	15.29	19.70
THERAPEUTIC RADIOLOGY	\$160,282.50	\$169,491.52	2.11	2.23
YALE CANCER CENTER	\$163,541.27	\$180,039.91	3.09	3.40
Totals	\$6,510,373.65	\$7,857,471.85	2.75	3.32

Discussion:

Based on a large literature search, no values for uncompensated care have previously been generated using an opportunity cost model to value physician time at a single institution. Although Gruber et al. provided the analysis of a larger group of physicians, the large spectrum of practice settings and their various administration models and incentives structures creates some difficulty in pinpointing the source of uncompensated care and makes it somewhat more complex to track over time. Using their approach, one could imagine a situation in which some physicians (perhaps in AMCs) would provide ever more uncompensated care while, at the same time, physicians in other locations would “counteract” these values with more profitable enterprises. In such a situation, charity care by certain physicians would be masked by profits generated by their colleagues.

The benefit of using a single AMC with a centralized governing model is the potential to link changes in administrative incentives with changes in uncompensated care outcomes. Presumably, an AMC such as Yale, based on the historic charitable mission and proximity to disadvantaged patients and large clinical infrastructure, can exert a large influence over the uncompensated care dynamics in its community. Any change in the provision of such care at such an institution would have many ramifications. Thus, the appropriate valuing of such care is a requisite first step.

Write-offs

The use of write-offs (included in the first 3 tables of the results) highlights an important issue in valuing charitable care. Inherent in the accounting of write offs is the difference

between the charges generated for a patient and the actual payments made by that patient. However, as stated earlier, this difference reflects a largely inflated value generated by the inflated non-negotiated charges charged to self-pay patients. Since the inflated prices are generated from negotiated rates and not from market forces, these prices represent a slightly skewed “value”. An example from Table 2 will help clarify this. In 2008, the Anesthesiology department generated \$2,812,016 in charges and \$1,025,264 in write offs. However, using the opportunity cost model described in the methods section, the value of uncompensated care was \$369,622. This represents a significant difference.

Comparison of values

Using the opportunity cost approach, the total value of Uncompensated Care provided by physicians in Fiscal Year 2008 as part of the Yale Medical Group was \$6,510,373.65. This represents 2.75% of the total payments made for the same year. This percentage can be compared to other estimates of the provision of such care.

Comparison to write-offs

The total “Write-offs” for FY2008 (Bad debt and Free Care total write-offs) was \$18,165,589 whereas the calculated total “Uncompensated care” was \$6,510,373.65. The total in terms of percentage would be 7.67% of total payments vs. 2.75%. Again, these estimates reflect the different “valuing” of physician time.

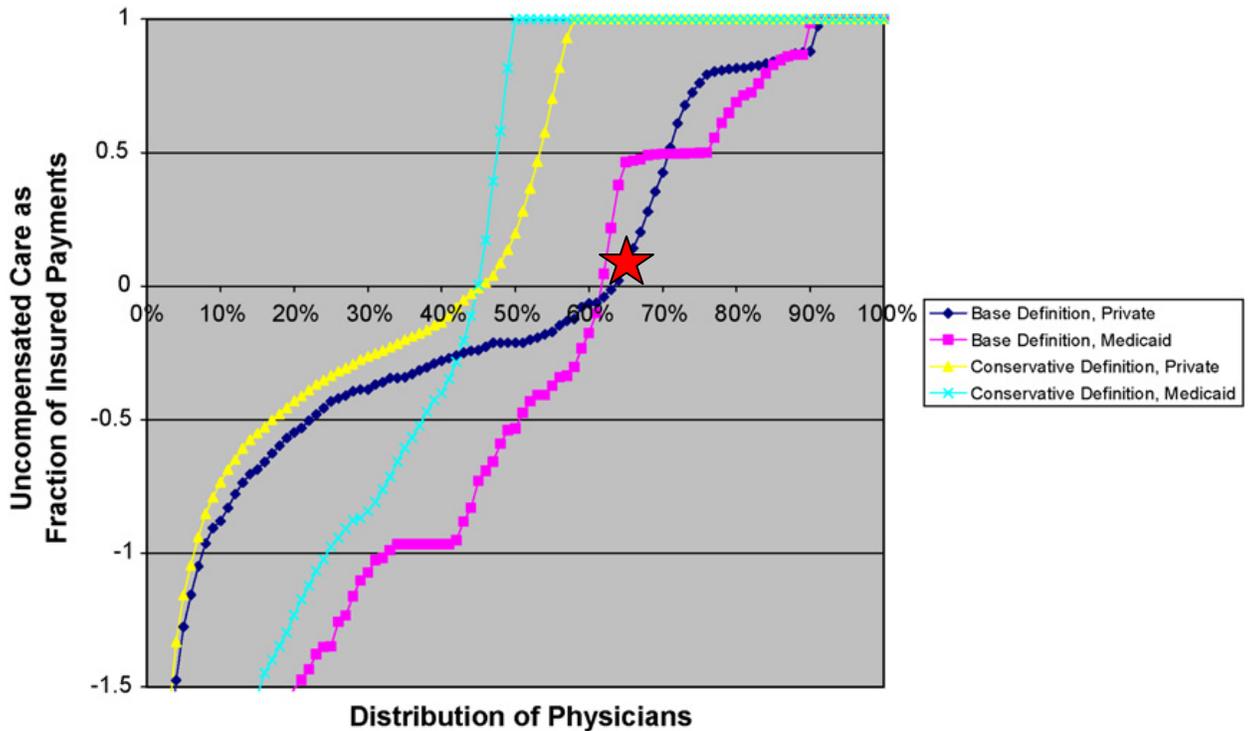
Comparison to earlier published estimates

Because estimates of physician-provided care are sparse, values from previous studies are not current and cannot be directly compared to the values generated in this study. However,

they can provide a sense of the effects of different accounting mechanisms and the evolution in levels of care provided. In 1978, Sloan et al., using a 1977 nationwide survey of physicians, “found that charity care amounted to 2.7% of gross billings and that bad debts accounted for an additional 8.4% of gross billings”¹⁵ with a total of more than **11%** of billings. In 1985, Ohsfeldt used the AMA’s “Socioeconomic Monitoring System from 1982 found that physicians donated 9% of billings to charity care and 6.3% to bad debt with a total of **15.3%** of billings. In 1991, Kilpatrick et al. found that **10.4 %** of billed amounts of a random sample of physicians from Florida were unresolved (and hence, constituted a combination of bad debt and charity care). All of these previous studies used billed charges and hence generated values many times higher than the calculated amounts in this study. However, as stated earlier, it must be kept in mind that the billed amounts do not represent “real” market value.

Comparison to analysis by Gruber et al in “How much uncompensated care do doctors provide?”

In their analysis of uncompensated care provided by physicians, Gruber determined that even in their most generous estimates, physicians provided no more than 0.8% of uncompensated care and that they were most likely providing no overall uncompensated care whatsoever. They did, however, describe a system in which uncompensated care was unevenly distributed. Based on the findings generated in this study, physicians at Academic Medical Centers such as Yale would constitute a distinct subpopulation that would fall on the right upper hand side of the graph describing the distribution of uncompensated care (starred on following graph).



Assuming that both the current study and the Gruber study accurately represent reality, the combined interpretation of these results would suggest that academic physicians as a whole at Yale are more “generous” than most physicians (~ 65% of all physicians) but that many more physicians (~35%) in different settings are providing higher levels of uncompensated care.

Breakdown per department

Of course, physicians at Yale practice under different clinical circumstances and treat a different patient payer mix. As could be predicted, different departments at Yale provide

different levels of uncompensated care and this is reflected in the result in Table 1. In FY2008, these values ranged from 0.57% (in Pediatrics) to 15.29% (in Emergency Surgery).

The striking difference in levels of uncompensated care in different departments can, to some extent, be explained by certain obligations and government support. For example, the department offering the lowest calculated amount of uncompensated care, Pediatrics, treats a population that is largely covered by Connecticut Husky Healthcare (the CT SCHIP program). The department offering the highest level of uncompensated care, Emergency Surgery, is required by the EMTALA laws of 1986 to stabilize patients regardless of insurance status and effectively “donates” very costly surgical interventions often without being reimbursed.

Of specific interest are the departments that fall in between these two predictable extremes. For example, the department of Neurosurgery provided \$29,739,260 of uncompensated care or 0.61% of total payments (\$4,903,132) for the year 2008 while the department of Neurology provided \$67,233.51 or 2.57% of total payments (\$2,619,401). This 400% difference in rates would suggest that the department of Neurosurgery either passively benefits from a better payer mix or that it actively limits donations of free services or that it exerts more effective billing collection strategies, (or a combination of these factors).

At any rate, the differences in departmental uncompensated care values highlighted by this approach would not otherwise have been so apparent. In fact, if one were to look simply at write-offs, the Neurology and Neurosurgery departments would look much more similar. Under total write-offs for 2008, Neurology donated \$188,989 (7.2% of payments) whereas Neurosurgery donated \$241,014 (5.0% of payments) for a much smaller interdepartmental difference of 144%.

Thus, simply being aware of these calculated values opens up a series of questions regarding departmental policies and priorities regarding the care of the medically indigent.

Although it may be possible that no individual physician purposefully or actively limits the care of the indigent, the marked differences in values for certain departments in Table 4 does call into question departmental incentive structures that may, in reality, be influencing outcomes in an indirect fashion. As one example illustrates, policies aimed at shortening delays for insured patients would effectively curtail uncompensated care in an environment where clinics are already near full capacity.

Simply being aware of these values is important as any departmental policy change has the potential to affect uncompensated care. Knowledge of current values could serve as a means of setting baseline statistics and determining eventual departmental targets.

Medicaid Adjustments

Included in the result tables are the adjustments to the uncompensated care values generated by subtracting the charges and payments made on the behalf of patients covered by Medicaid. Since Medicaid pays on average less than Medicare and private insurance and since many physicians in the community at large are able to refuse Medicaid patients, payments made under this government insurance plan decreased the average opportunity cost and in effects lowers the amount of uncompensated care calculated with this model. These results demonstrate the expected results: removing Medicaid patients from the average increases the amount of uncompensated care provided. Overall, this represents an increase from 2.75% of total payments to 3.32% of total payments. However, since no academic medical center could realistically replace all its Medicaid patients with other insured patients, the true calculated value lies somewhere between these two extremes.

Weaknesses of this approach

Implicit in the use of opportunity cost models is the notion of a substitution of a medically indigent patient for an insured patients and hence the assumption that physicians are always fully occupied. This is certainly not always the case and thus the values generated in this study cannot accurately or fully represent the reality of uncompensated care. In fact, one would assume that a physician providing free services is not always fully occupied and that the true value of his/her time is somewhat smaller than the values generated here. Hence, the opportunity cost model and its results probably represents an overestimate of the true value.

Also, this model assumes that physician activities are completely accounted for in billing data. If physicians donate time that isn't represented in the financial database (certainly the case to some extent), it will not be represented and could lead to an underestimate of the true value.

Future directions

The calculated value of physician-derived uncompensated care for fiscal year 2008 using this approach sets a baseline for future comparisons at the Yale Medical Group. Subsequent or previous years can then be analyzed and compared. Given the importance of an academic medical center such as Yale to the provision of such care, it is important to monitor these activities using a model that reflects the most accurate values possible. Future modeling would have to take into account several possible confounders. It is possible for instance, that future adult patients might benefit from new government-sponsored programs. In such a situation, calculated uncompensated care would be presumed to fall without affecting the provision of care to the larger community. Thus, any changes in patient insurance levels would

have to be controlled for over time. Also, as average physician reimbursements for each billable charge changes over time, so does the calculated opportunity cost. For instance, if a billed charge frequently used by the uninsured is reimbursed at a much lower rate in a subsequent year, calculated uncompensated care would fall without there being a true change in physician activity (or much change in physician payments). Thus, it would be necessary to monitor changes in reimbursement rates at the CPT code level (taking into account the weighted contribution of each CPT code to bad debt and free care categories) and compare these to the changes in uncompensated care. If the changes in CPT reimbursement mirror the changes in uncompensated care, then one could assume that no change in provision has actually taken place.

Since the Yale Medical Group represents only a subset of the larger issue, this approach could also be replicated in various other settings, other academic medical centers and private practice groups. Extending this calculation using primary financial data would constitute a more accurate assessment than current assumptions, write-offs and self-reported surveys.

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