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Does Mission Really Matter?"

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Measuring Charity Care in Catholic Nonprofit Hospitals:

Does Mission Really Matter?

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DOES MISSION REALLY MATTER?

HOW WELL ARE CATHOLIC HOSPITALS DOING IN THE PROVISION OF CHARITY CARE?

That nonprofit hospitals are becoming more "businesslike" may be viewed either as a compliment or as a criticism, depending on how one evaluates the efficiency and mission of nonprofit hospitals. If, for example, becoming more businesslike is tantamount to becoming more efficient, then those who maintain that nonprofit hospitals spend too many resources on unnecessary, expensive technology or services would view the change positively. (See Newhouse, 1970; Clark, 1980.) If, on the other hand, becoming more businesslike is equated with the loss of the nonprofit hospital's charitable mission -- a loss which would make the nonprofit hospital indistinct from its for-profit competitor -- then the current situation of nonprofit hospitals is a cause for concern.

In either case, a tension clearly exists between the "mission and margin" that challenges nonprofit hospitals to demonstrate the existence, vitality, and distinctiveness of their health care missions. The source of this tension is both legal and organizational.

From a legal perspective, nonprofit hospitals are eager to demonstrate the uniqueness and vitality of their charitable missions because the local, the state, and the federal governments currently treat nonprofit hospitals differently from for-profit hospitals. This differential treatment, which is most obvious in tax policy, is predicated upon the assumption that nonprofit hospitals are organizationally and operationally different from their for-profit counterparts, and that they do charitable works that benefit the community.

From an organizational perspective, the sponsors of nonprofit hospitals are concerned about how the nonprofit health care mission is being

communicated to and realized in society. Specifically, some sponsors, especially those representing a variety of religious denominations, have wondered aloud whether they should discontinue their sponsorship of health care organizations because market considerations may have made it impossible to fulfill the traditional nonprofit mission. Why, they wonder, should they continue to commit resources to health care when their ability to serve the poor or socially dispossessed, the traditional target groups of the nonprofit hospital, is little better than that of their for-profit competitors?

Using a sample of Catholic nonprofit hospitals, this research begins to address these concerns by examining how nonprofit hospitals "measure up" on one dimension of the traditional service mission, that is, in the provision of charity care. Toward that end, this paper 1) discusses the difficulties of defining and operationalizing measures of charity care; 2) defines and operationalizes four measures of charity care: pure charity care; uncompensated care; unreimbursed charity care; and total charity care; 3) uses these operationalized measures to estimate and compare the levels of charity care that are being contributed by the hospitals in the sample; and 4) tests relationships between these measures and four sets of factors that hypothetically account for the variation in levels of charity care: the characteristics of the policy and market environments; the characteristics of the local population; the characteristics of the health care delivery system; and the religious influence that comes through leadership and presence of the members of the hospital's sponsoring body -- whether the sponsor is a religious congregation or a diocese/archdiocese.

The data for this research are drawn from a number of sources. These sources include the 1986 Catholic Health Association Care of the Poor Survey;

the 1987 and 1988 Catholic Health Association Annual Surveys; the 1987 Annual Survey of the American Hospital Association, the 1986 CACI Source of Demographic and Market Data, and the U.S. Official Catholic Directory for 1985 and 1986. Using these sources, this research both establishes a basis from which to examine current tax-exemption policy, and develops a set of measures that will make it possible to contrast the operations of nonprofit hospitals with those of their proprietary counterparts.

The Debate Over Definitions of Charity Care

Empirical studies of charity care have been relatively inconsistent in their definition and application of this term. As a consequence, the results of these studies are generally incomparable and/or inconclusive in their statements about charity care and what factors cause variation in charity care across hospitals. For example, in their study of U.S. Catholic hospitals, Eckels and Lewin (1988) defined charity care as "uncompensated care," that is, as a pure charity care plus bad debts. Basing their research on estimated costs rather than on charges by using a cost-to-charge deflator, Eckels and Lewin concluded that "the uncompensated care provided by Catholic hospitals is roughly commensurate to their share of all U.S. hospital beds" (Eckels and Lewin, 1988, p. 17). Moreover, they found that uncompensated care levels varied widely by differences in Medicaid coverage and eligibility requirements. Further, when they measured the uncompensated care burden as a percent of total expenses, they found that the burden of charity care varied widely by hospital type, by state and within state, and by the presence of a public hospital (Eckels and Lewin, 1988; Lewin, Eckels, and Miller, 1988; Lewin, Eckels, and Roenigk, 1988).

Sloan and Valvona (1986) and Herzlinger and Krasker (1987) also used the uncompensated care measure in their studies. They measured uncompensated care as a percent of gross patient revenues, that is, as charges measured as discounts from gross charges per patient day (Sloan and Vraciu, 1983). They did not attempt in these studies to separate charges from costs. Different applications of the uncompensated care measure and how it can be measured make it difficult to compare the results of one empirical study with another. Nevertheless, research using the uncompensated care measure helps focus attention on three measurement issues that shape the debate about the efficacy of one charity care measure relative to another. These issues, each of which needs its own discussion, include the measurement of "pure" charity care, the measurement of bad debts, and the measurement of contractual shortfalls from Medicare and Medicaid.

THE MEASUREMENT OF "PURE" CHARITY CARE

For accounting purposes, "pure" charity care includes all charges, whether in full or in part, which, by prior agreement, a hospital acknowledges and records as a patient's being unable to pay for the services that he or she receives. Moreover, the hospital recognizes that no other sources of payment stand behind the patient to reimburse the charges that he or she cannot assume (HFMA, 1987; Eckels and Lewin, 1988; Lewin, Eckels, and Miller, 1988). Pure charity care is distinguished from bad debt because there is a pre-approved agreement not to try to collect the full or partial charges due the hospital. Pure charity excludes contractual shortfalls from Medicare, Medicaid, and other governmental programs. Moreover, it generally excludes undesignated

philanthropic funds generated to support the provision of charity care (HFMA, 1987).

THE MEASUREMENT OF BAD DEBTS

The definition of bad debts, while much more straightforward than the definition of pure charity care, nevertheless presents its own difficulties. The measure of bad debts includes all the charges the hospital is unable to collect from people who, prior to services being rendered, were considered as being able to pay for all or part of the bills they incurred but who, for any number of reasons, did not make the payment. Because the hospital makes no prior written indication of the patient's inability to pay for treatment, even though there may have been some prior discussion about the patient's financial incapacity, bad debt costs cannot be counted as pure charity in the aforementioned sense.

THE MEASUREMENT OF CONTRACTUAL SHORTFALLS FROM MEDICARE AND MEDICAID

Contractual shortfalls from Medicare include the difference between gross patient revenue and what Medicare pays the hospital according to the appropriate Diagnostic Related Group (DRG) schedule. Medicaid shortfalls typically include the difference between gross patient revenue and the per diem rate that each hospital negotiates with the state's Medicaid provider agency. Medicaid shortfalls differ from contractual allowances insofar as allowances are based on charges while shortfalls are based on costs (Eckels and Lewin, 1988).

THE UNCOMPENSATED CARE MEASURE:

AN ILLUSTRATION OF THE DIFFICULTIES OF MEASURING CHARITY CARE

The measurement issues that surround pure charity care, bad debts, and shortfalls from Medicare and Medicaid contractals illustrate some of the problems with constructing measures of charity care. Most of these problems can be illustrated through an examination of the strengths and limitations of the uncompensated care measure.

Uncompensated care has typically been defined as the "difference in dollars between what hospitals charge and what they collect from private insured and uninsured self-pay patients" (Lewin, Eckels, and Roenigk, 1988, p. 1), or as "the combination of charity care and bad debt deductions from gross patient revenue" (Eckels and Lewin, 1988, p. 11). Self-pay patients are the "major source of uncompensated care since many are either unable or unwilling to pay what is charged" (Lewin, Eckels, and Roenigk, 1988, p. 1). Self-pay patients typically include those who cannot afford third-party coverage, and/or who do not qualify for governmental assistance programs. Self-pay patients are usually either unemployed or underemployed.

As it is typically defined in the health care field, uncompensated care is the sum of pure charity care and bad debt. According to this definition, the difference between charges and payments cannot be considered uncompensated care if it results from a special pricing arrangement before services are rendered. For example, discounts accorded to board members, clergy, physicians, and/or their families do not generally qualify as uncompensated care. Neither do shortfalls from negotiated rates under prospective payment systems, which typically result in contractual shortfalls; nor do contracted rates accepted by the provider as payment for services prior to their being

rendered. Thus, the differences between charges and negotiated rates that result from Medicaid payments, from other state payers, or from prospective payment plans arranged with HMOs, cannot be classified as uncompensated care, even when a hospital considers these payments inaccurate compensation for the true costs of health care (HFMA, 1987).

Most of the criticism of the uncompensated care measure focuses on the bad debt component. In particular, there is the nagging question of how to account for the part of bad debts that might otherwise be classified as pure charity care.

There are two approaches to this problem. On the more conservative side, some argue that to use bad debts as a measure of charity care is to reward poor management practices that result in the non-payment of bills by people who presumably could afford to pay them. From this perspective, uncompensated care becomes a suspect measure because it overstates the amount of charity care that a hospital contributes.

On the other hand, some researchers argue that a portion of bad debts clearly is charity care that simply had not been written off formally before the service had been provided. This perspective on bad debts has been addressed in a Florida study of indigent care. Specifically, the study found that "almost half of what not-for-profit hospitals in that state were defining as bad debt was actually care to persons who were below 150 percent of poverty, or about \$16,800 for a family of four" (State University Study of Indigent Care, 1986, quoted in Eckels and Lewin, 1988, p. 11).

Apart from the Florida study, there has been little research into the measurement of the proportion of bad debts that may be more appropriately classified as pure charity care. Thus, there is no unambiguous way to tie the

hospital's charity contribution to a poor/needy/indigent recipient. Moreover, the extent to which a hospital is able to differentiate between pure charity care and bad debt clearly differs according to its management practices.

In addition to problems with the bad debt component of uncompensated care, there are at least two other difficulties with the uncompensated care measure. First, the uncompensated care measure is typically drawn from charges, that is, deductions from revenue, rather than costs. For example, Sloan and Vraciu used an uncompensated care measure where its component parts -- pure charity care and bad debt -- were calculated as deductions from gross revenues, that is, from charges (Sloan and Vraciu, 1983). And, as noted earlier, Sloan and Vraciu (1986) and Herzlinger and Krasker (1987), calculated charity care as a percentage of gross patient revenues.

The incorporation of charges into any aspect of a measure of charity care, whether an uncompensated care measure or some other measure of charity care, has been criticized because the resulting figures would over-report the actual costs of charitable activity. The reason for this is that charges presumably include a mark-up over actual costs. Consequently, measures based on charges rather than on costs distort reported levels of charity care across hospitals.

Because cost figures are generally not available for individual services or procedures, methods to estimate charity care costs must be devised using existing data. One approach, that of Lewin, et al., is to calculate costs as a percentage of gross patient revenues by multiplying charity care dollars by a cost-to-charge ratio for each hospital. Insofar as total operating expenses reflect the costs of the operation of a hospital, the cost-to-charge ratio should reflect the proportion of gross revenues which are true costs, as

opposed to mark-ups. Presumably, the application of this ratio to the various components of charity care -- components which are all deductions from gross patient revenues -- will adjust charity care figures downward to a point where they more clearly estimate costs rather than charges. Given current hospital accounting practices and the lack of incentives for hospitals to collect more uniform cost center data, the derivation of more accurate, reliable, non-estimated cost data is not currently possible. Thus, "state-of-the-art" technology relies on cost estimates generated through the application of the cost-to-charge ratio.

In addition to the problem of using charges instead of costs, there is a second problem that affects the validity and reliability of the uncompensated care measure. Most measures of charity care -- uncompensated care among them -- do not recognize the costs of being reimbursed by governmental for Medicare and Medicaid programs at rates substantially lower than what it reportedly costs a hospital to provide services. Thus, many believe that measures that do not include shortfalls from contractuals vastly understate the real financial write-off that a hospital makes in providing services to the poor. They argue that "the difference between payment and costs can appropriately be counted as charity, as it is unreimbursed care for low income patients" (Eckels and Lewin, 1988, p. 13).

Not everyone agrees with this argument, however. Those, typically governmental representatives, who disagree with counting contractual shortfalls as charity care costs, argue that a hospital freely enters into a contract with the state or the federal government to provide services at a certain cost. Presumably, if the service could not be provided at that contract rate, a hospital would not enter into an agreement with the

government. To do so would be to jeopardize the financial integrity of the hospital.

However, there is also a rejoinder to this argument. Hospital administrators counter that their hospitals have entered into what amounts to a forced contract with the government, and that they have no other choice if they wish to remain competitive with other hospitals and/or to provide services to the poor.

Operational Definitions of Charity Care

Despite the difficulties of getting "clean" financial data, financial components nevertheless must be incorporated into any operationalized definition of charity care. With this in mind, the following definition of charity care, soon to be operationalized in four measures for purposes of comparison, is proposed.

Charity care is the financially quantifiable costs of activities, services, or programs that a hospital provides for an individual, but for which the hospital is not fully or partially compensated. Thus, the hospital alone bears the costs of charity care. No other source of payment is forthcoming. That is, the hospital cannot look to the government, to private insurers, or to the patient as a source of funding to offset the costs of the services it provides.

Reflecting the lack of consensus about what the types of costs that should be included in measures of charity care, this research proposes four

different measures of the concept: "pure" charity care; uncompensated care; unreimbursed care; and total charity care.¹

"Pure" charity care includes the "up-front" write-off of all costs to those patients that a hospital has classified as unable to pay prior to services being rendered. The write-off may include all or part of the bill.

Uncompensated care is measured as the sum of the costs of pure charity care and bad debts. Here, bad debts include the costs of care which a hospital has been unable to collect from patients who, either through personal resources or through their insurance companies, are presumably able to pay their bills but do not do so.

Unreimbursed care is measured as the costs of pure charity care and Medicare and Medicaid contractual shortfalls. Contractual shortfalls include the difference between what it costs a hospital to provide a service and the rate at the government reimburses the hospital for providing that service.

Total charity care, as the name implies, is the most inclusive measure of charity care. It includes the costs of pure charity care, bad debts, and Medicare and Medicaid contractual shortfalls.

As noted earlier, this research is based on estimates of charity care costs that result from the differences between revenues and costs rather than the differences between revenue and charges. Thus, each of these measures has incorporated Lewin's cost factor to estimate charity care costs. This factor, or cost-to-charge ratio, is defined as "Total Operating Expenses divided by the sum of Gross Patient Revenues and Other Operating Revenues." Exhibit 1

¹ The components of these measures are not mutually exclusive. Rather, elements of one measure may be found in other measures because the goal is to compare variation across different measures, rather than to build a system of measures based on hierarchically increasing components.

summarizes how each of the four charity care measures will be operationalized for this research.

EXHIBIT 1

COST FACTOR = Total Operating Expenses/(Gross Patient Revenues + Other Operating Revenues).

PURE CHARITY = (Deductions from Revenue for Charity Care) * (COST FACTOR).

UNREIMBURSED CHARITY = (Deductions from Revenue for Shortfalls from Medicare and Medicaid Contractuals + Charity Care) * (COST FACTOR).

UNCOMPENSATED CHARITY = (Deductions from Revenue for Charity Care and Bad Debt) * (COST FACTOR).

TOTAL CHARITY = (Deduction from Revenue for Charity Care, Bad Debt, and Shortfalls from Medicare and Medicaid Contractuals) * (COST FACTOR).

In the section that follows, each of these measures will be modeled, estimated, and analyzed to explain the variation in charity care levels across the sample of Catholic hospitals.

The Theoretical Model

Assuming that these four measures of charity care vary across Catholic hospitals, what factors might explain this variation? With some modification, a model that relates levels of charity care to independent explanatory factors can be derived, at least in part, from the research of Andersen, Aday, and Newman on health services utilization (Aday and Andersen, 1974; Andersen and Aday, 1978; Andersen and Newman, 1973); from the work of Friedman, Morrissey, Shortell, et al., on the differences between nonprofit and for-profit multi-institutional hospital systems (Friedman and Shortell, 1988; Shortell and

Morrissey, 1985; Shortell, et al., 1986); and from the Lewin's work on the effect of a nearby public hospital (1988).

RESEARCH ON HEALTH SERVICES UTILIZATION

The Andersen and Aday model posits that the utilization of health care services is shaped by two sets of characteristics: 1) the characteristics of the population-at-risk, and 2) the characteristics of the health care delivery system. As a predictive model of the utilization of health services, the Andersen, Aday, and Newman model can also be applied to the utilization of charity care and community benefit services. Because the utilization of all types of hospital services includes the utilization of charity care services, a theoretical relationship between levels of the four measures of charity care may be modeled partly as a function of those components that affect utilization in general, that is, of the characteristics of the population at risk, and of the characteristics of the health care delivery system. These hypothetical relationships will be modeled in the sections that follow.

Characteristics of the Population-at-Risk

According to Andersen, Aday, and Newman, the population-at-risk are those who seek access to health care. These people can be modeled by the predisposing, enabling, and need/illness characteristics. Described as

...the individual determinants of utilization, the predisposing component includes those variables that describe the propensity of individuals to use services....They include such things as age, sex, race, religion, and values concerning health and illness. .

The enabling component describes the 'means' individuals have available to them for the use of services. Both resources specific to the individual and his family (e.g., rural-urban character, region) are included here.

The need component refers to illness level, which is the most immediate cause of health service use. The need for care may be either that

perceived by the individual or that evaluated by the delivery system (Aday and Andersen, 1974, p. 213).

The Andersen, Aday, and Newman research models the relationships of each of these sets of characteristics to health services utilization on the assumption that different types of people different access to health care depending on certain socio-demographic "'givens,' customs, or beliefs" (Aday and Andersen, 1974, p. 214).

Reflecting the work of Andersen, Aday, and Newman, the first hypothesis, which relates levels of charity care to the characteristics of the local population, states:

1. The characteristics of the local population -- a significant part of the population at risk -- significantly and substantively affect levels of charity care.

The local population is part of the population-at-risk who, whether by tradition and/or by mission, hospitals are obligated to serve. Consistent with the Andersen, Aday, and Newman model, the characteristics of the local population can be decomposed into predisposing, enabling, and need/illness characteristics.

Characteristics of the Health Care Delivery System

In addition to the hypothesized impact that the characteristics of the population-at-risk has on access to health care, Andersen, Aday, and Newman believe that the characteristics of the health care delivery system affect health care utilization. The characteristics of the health care delivery system include organizational resources and the organization of the health care delivery system itself.

The resources of the health care delivery system include the structure, the equipment, and the materials used to provide health care services. It also

include[s] the total volume of resources relative to the population served and the way in which the resources are geographically distributed throughout the country. Volume includes personnel/population ratios for the various kinds of health-related occupations (including physicians, nurses, dentists, etc.) actively providing medical care. Total amount of resources can also be measured by facilities which provide patient care. In this case, nursing homes, and other institutions providing inpatient care are common measures (Andersen and Newman, 1973, p. 101).

Because they may be "geographically distributed throughout the country, the resources of the system "may not be homogeneously dispersed throughout the country" (Andersen and Newman, 1973, p. 101). Consequently, medical resources are apt to be more concentrated in some areas than in others. This is especially true in urban areas.

In contrast to resources, the organization of the health care delivery system describes the coordination and control of medical personnel and resources, that is, what the delivery system does with its resources (Andersen and Newman, 1973; Aday and Andersen, 1974). The organization component includes access -- the "means through which the patient gains entry to the medical care system and continues the treatment process" (Andersen and Newman, 1973, p. 102) -- and "the characteristics of the system that determine what happens to the patient following entry to the system" (Andersen and Newman, 1973, p. 102). Structure can be measured in terms of "the means of admission to the hospital, the characteristics of hospital care, and the disposition and care of patients following hospitalization (Andersen and Newman, 1973, p. 102). Predicated on this research, the second hypothesis states:

2. The characteristics of the health care delivery system will significantly and substantively affect levels of charity care and community benefit.

Characteristics of the Policy and Market Environments

While the Andersen, Aday, and Newman model suggests that charity care will be affected not only by the characteristics of the health care delivery system, but also and by the characteristics of the population at risk, the research of Shortell, et al. (1986) suggests that the characteristics of the environment, especially market conditions and current public policy, also play a role. Their research on hospitals affiliated with multi-hospital systems suggests three factors that cause variation in levels of charity care and community benefit: the intensity of competition from other nearby private nonprofit and for-profit hospitals; the degree of local or state regulation; and the existence of a nearby public hospital.

In particular, they discovered that multi-institutional system hospitals offered more services when competition was higher than when competition was low. Under these circumstance, might they not also provide more charity care services, a subset of all hospital service? Another study of eight multi-hospital corporations, three of which were for-profit and five of which were nonprofit, Friedman and Shortell (1988) reported that regulatory and competitive pressures had positive effects on hospital costs. These results were similar to those of Robinson and Luft (1985, as cited in Friedman and Shortell, 1988), who found that the number of competitor hospitals in an area affected average costs, even when controlling for differences in case mix and the characteristics of the local population.

In terms of regulation, Friedman and Shortell (1988) also produced evidence that expenses grow more slowly in states with rate review programs.

Moreover, their research indicated that there were correlations between regulatory measures and Medicaid eligibility for hospital payments per recipients.

In addition to the impact that competition and regulation have on hospital behavior, the presence of a public hospital also seems to affect levels of charity care in neighboring nonprofit hospitals. For example, Lewin (1988) found that when a public hospital was nearby, neither for-profit nor nonprofit hospitals made substantial contributions of charity care.

Taken together, this research suggests that

3. market factors and the characteristics of the policy environment will have a statistical and substantive affect on levels of charity care.

Among the types of variables that model the policy and market environments and, therefore, hypothetically impact levels of charity care are the intensity of market competition; the presence or nonpresence of a public hospital in the county; the average state public aid payment; and the extent to which a hospital must comply with state regulations.

The Religious Influence on Nonprofit Hospitals

While there are fairly strong theoretical reasons to expect causal relationships between the measures of charity care and the characteristics of the local population, the characteristics of the health care delivery system, and the characteristics of the policy and market environments, there is a less developed, but fairly compelling theoretical basis for linking levels of charity care to the religious influence in nonprofit hospitals. Most of this influence comes through the presence and efforts of the members of the religious congregations of men and women that sponsor and/or staff almost 95

percent of all Catholic hospitals (CHA Annual Report, 1988-1989). (Dioceses and archdioceses generally sponsor the remainder.)

How do the religious congregations of men and women exert influence on the policies and operations of Catholic hospital, especially in regard to behaviors that affect levels of charity care? One explanation for their influence can be hypothesized in terms of the theory of principals and agents. According to Pratt and Zeckhauser,

Whenever one individual depends on the action of another, an agency relationship arises. The individual taking the action is called the agent. The affected party is called the principal....

The challenge in the agency relationship arises whenever -- which is almost always -- the principal cannot perfectly and costlessly monitor the agent's action and information....

[Because] agents typically know more about their tasks than their principals do, though principals may know more about what they want accomplished -- we cannot expect any business to function as well as it would if all information were costlessly shared or if the incentives of principals and agent(s) could be costlessly aligned. This shortfall is sometimes called the agency loss or agency costs. The challenge in structuring an agency relationship is to minimize it (Pratt and Zeckhauser, 1985, pp. 2-3).

In the language of Pratt and Zeckhauser, religious congregational members, in their dual roles as hospital sponsor and health care provider, are the principals and the agents of the organizational mission and behavior. As such, to what extent will they be able to mitigate the types of agency problems that typically occur in nonprofit organizations? How might religious sponsors, in their principal/agent roles, affect organizational policy as it relates to charity care when there is no profit-motive and no set of self-interested shareholders to discipline the nonprofit organization?

While it is true that Catholic hospitals do not operate on behalf of the interests of shareholders, they do operate in the interests of their religious

sponsoring body. These sponsors not only "back" the hospitals financially through loans and personnel, but they are also responsible for insuring the mission of the organization in their role either as "corporate member," or in their congregational or diocesan leadership positions.

The corporate member is a legally recognized group of representatives of the sponsoring congregation or, in the case of a diocese, it may be the bishop/archbishop. In their structuring of the hospital corporation, a sponsor, by legislating a role for the corporate member, reserves power to itself in order to ensure the mission of the Catholic hospital. In some areas -- especially those related to mission and finance, the authority of the corporate member exceeds that of the board of directors. While the extent of these powers varies from one sponsoring body to another, and some sponsoring bodies reserve more powers to the corporate member than others, virtually every corporate member reserves the right: (1) to establish and approve changes in the mission or operating philosophy of the hospital; (2) to amend or approve amendments to the corporate charter and by-laws (3) to appoint or ratify candidates for the board of directors; (4) to lease, sell, or mortgage more than one million dollars of the corporation's assets;² and 5) to merge or dissolve the corporation. In addition to these, some sponsors also reserve the power to control the appointment of the chief executive officer (CEO), approve the capital and operating budgets, and/or select the organization's auditing firm (Maida and Cafardi, 1984; Mally, 1986).

In the cases where a hospital is not separately incorporated from its religious sponsor, the control exerted by the sponsor is usually even more

² The one million dollar amount is established by the Church in Canon Law.

direct. For example, the elected leadership of the congregation may directly oversee hospital operations, often serving both as representatives of the sponsor as a members of the board of directors.

In addition to the influence religious sponsors exert influence on the hospital, either through the corporate member or through the leadership of the congregation, they also play a direct role in the governance of the hospital. For example, members of the sponsoring body constitute between one-third and one hundred percent of the individuals who serve on the hospital's board of directors (Sanders, 1989). Further, sisters and brothers usually serve in administrative and staff capacities, as well as in direct service roles throughout the hospital.

At one time, the control that religious congregations exerted through their roles in governance, administration, and direct service was virtually total because religious sisters and brothers usually served in these positions to the exclusion of those who were not members of the sponsoring congregation. However, with dwindling personnel, religious congregations now have fewer people in governance, administrative, and staff positions. Consequently, the role of the congregational sponsor, if not the diocesan/archdiocesan sponsor, has shifted. Currently, religious sponsors are becoming more the principals and less the agents of Catholic health care.

Under these changing circumstances, how much influence will congregational sponsors be able to exert on hospital policy, especially those policies that affect levels of charity care? The research of James and Rose-Ackerman (1986) leads to the prediction that today's religious congregations will have only a minimal impact on hospital policy and operations. Their work suggests this conclusion because of the increase in agency costs that usually

occur when the goals and incentives of the principals and agents tend to differentiate, as may be the case when lay people unfamiliar with the sponsoring body's congregational and health care mission begin to replace members of the sponsoring congregation in leadership and direct service positions. In the absence of similar goals and strong incentives, James and Rose-Ackerman predict that there will be a greater need to monitor the daily operations of the organization in order to insure the organizational mission. This may become very costly for the organizational sponsor. Moreover, high agency costs are predicted in nonprofit organizations because nonprofit organizations presumably lack the discipline of the market and the oversight that profit-maximizing shareholders seem to provide in for-profit organizations. Lacking this discipline and a self-interested profit motive, Catholic nonprofit hospitals would, James and Rose-Ackerman suggest, have little incentive to operate efficiently or in the interests of others such as the poor.

However, the role that the sponsor plays suggests that Catholic nonprofit hospitals and, perhaps, most church-sponsored hospitals, will not succumb to the agency problems that characterize other types of nonprofit organizations, including nonprofit community hospitals. Why? In most cases, the board of directors in community-sponsored hospitals is usually controlled by self-appointed boards of directors accountable to the "community-at-large." Clearly, this is not the case for Catholic nonprofit hospitals. Rather, Catholic nonprofit hospitals are accountable to an identifiable group of people having a common interest. In this sense, Catholic nonprofit hospitals are similar to proprietary hospitals that are governed and operated by shareholders and managers with a strong vested interest in hospital

operations. Unlike proprietary hospitals, however, those who share the common and controlling interest in Catholic nonprofit hospitals are not usually interested in making a profit as much as they want to perpetuate and improve upon the Church's healing mission -- a mission traditionally targeted toward the poor and society's dispossessed.

While different religious congregations share a common interest in the Church's healing mission and in their desire to control the operations of their hospitals in significant policy areas, they differ in the numbers of personnel available for this task. Thus, one would expect that they would also differ in the extent to which they are able to influence policy that affects levels of charity care. The fourth hypothesis asserts this relationship:

4. Because of their common interest in perpetuating their traditional mission to the sick, especially to the sick poor, the religious personnel of the sponsor will substantively and significantly affect levels of charity care in a positive direction.

THE THEORETICAL RELATIONSHIPS: A SUMMARY

Several significant pieces of empirical research can be used as the basis for hypothesizing relationships between charity care and the characteristics of the market and policy environments, the characteristics of the local population, and the characteristics of the health care delivery system. While there has not been much, if any, empirical research to link the influence of the religious sponsors to hospital behavior, the literature on the theory of principals and agents suggests that the influence of the religious sponsor, may also have a positive impact on levels of charity care. The relationships between these four sets of factors, their component parts, and the four measures of charity care are modeled Exhibit 2.

EXHIBIT 2

A MODEL TO EXPLAIN VARIATION IN FOUR MEASURES OF CHARITY CARE

$\ln(Y_i)$ = $f(v_1, v_2, v_3, v_4)$, where

$\ln(Y_i)$ = the natural logarithm of the i th measure of charity care, that is, one of four measures of charity care: (1) "pure" charity care, which is written off as charity care prior to the delivery of services (LGPURE); (2) uncompensated care, which is written off as the sum of pure charity care and bad debts (LGUNCOMP); (3) unreimbursed care, which is composed of pure charity care and the write-off of shortfalls from Medicare and Medicaid contractals (LGUNRE); and (4) total charity, which is the sum of pure charity care, bad debts, and shortfalls from contractals (LGTOTCHA).

And

$v_1, v_2, v_3,$ and v_4 = vectors of the characteristics of:

(1) the market and policy environment (v_1); (2) the characteristics of the local population (v_2); (3) the characteristics of the religious sponsor (v_3); and (4) the characteristics of the health care delivery system (v_4).

EXHIBIT 2

(continued)

Specifically,

$$\begin{aligned} v_1 &= x_1, x_2, \text{ and } x_3 \\ v_2 &= x_4, x_5, x_6, x_7, x_8, x_9 \\ v_3 &= x_{10}, x_{11}, x_{12}, x_{13}, x_{14}, \text{ and } \ln(x_{15}); \text{ and} \\ v_4 &= x_{16}, \text{ and } x_{17}. \end{aligned}$$

The following functional form is hypothesized:³

$$\begin{aligned} (\ln)Y_i &= \alpha + \beta_1 x_1 - \beta_2 x_2 - \beta_3 x_3 + \beta_4 x_4 - \beta_5 x_5 \\ &- \beta_6 x_6 + \beta_7 x_7 + \beta_8 x_8 - \beta_9 x_9 + \beta_{10} x_{10} \\ &+ \beta_{11} x_{11} + \beta_{12} x_{12} + \beta_{13} x_{13} + \beta_{14} x_{14} \\ &+ \beta_{15} (\ln)x_{15} + \beta_{16} x_{16} + \beta_{17} x_{17} + \epsilon_i \end{aligned}$$

where

- x_1 = COMPETE, the number of nonfederal, non-state competitor hospitals in the county;
- x_2 = RPUBLIC, a dummy variable for whether there is a public hospital in the county (yes = 1; no = 0).
- x_3 = AID, the average amount of public aid for a given state;
- x_4 = PMINOR, the percentage of minority people in the area surrounding the hospital;
- x_5 = PPERCAP, the average per capita income in the area surrounding the hospital;

³ Unless there was some compelling theoretical interest to leave them in the equation, independent variables were not entered into the equation if they were only minimally correlated with the dependent variable, or if there was strong evidence of multi-collinearity.

EXHIBIT 2

(continued)

$x_6 =$	RURAL,	a dummy variable for whether the hospital is located in a rural area or another area (rural = 1; otherwise = 0);
$x_7 =$	MORTAL,	the 1988 HCFA mortality rate for a hospital, used as a proxy for the illness level of people who come to a hospital;
$x_8 =$	PRENTER,	the percentage of renters in the area surrounding the hospital;
$x_9 =$	SUBURB,	a dummy variable for whether the hospital is located in a suburban area or another area (suburban = 1; otherwise = 0);
$x_{10} =$	U87.68,	a dummy variable for whether the hospital has a 24-hour emergency room (yes = 1; no = 0);
$x_{11} =$	RMULTI,	a dummy variable for whether a hospital is a member of a multi-institutional system (1 = yes; 0 = no).
$x_{12} =$	COMBASED,	a scaled variable where a value of 1 is assigned to each of the following that are true: if the hospital has a continuity of care program; if the hospital has a community health promotion program; and if the hospital has a home health care program;
$x_{13} =$	C87.384,	a dummy variable for whether a hospital is a teaching hospital (1 = yes; 0 = no);
$x_{14} =$	RNPERBED,	the number of nurses per staffed bed;
$\ln(x_{15}) =$	LG87.156,	the natural logarithm of the number of staffed beds;
$x_{16} =$	SERVHOSP,	the number of sisters who served in the hospital in 1985;
$x_{17} =$	RRELLAY,	a dummy variable for whether the CEO of the hospital is a member of a religious congregation (1 = yes; 0 = no); and
$\epsilon_1 =$		a randomly distributed error term.

Statistical Findings About Levels of Charity Care

In the section that follows, statistical findings related to the four measures of charity care will be discussed. Specifically, the section begins with a presentation of several descriptive statistics to characterize the sample and to differentiate the dependent measures. Then, adapting common economic measures of the inequality of income distribution throughout the United States, the second part features measures of the extent to which charity care is unevenly distributed across the Catholic hospitals in the sample. Finally, the last section concludes with an attempt to measure the variation in the levels of the four measures of charity care by using multiple regression techniques and the inferential statistical procedures associated with them.

DESCRIBING THE SAMPLE

First efforts to compare the four measures of charity care relied on descriptive statistical methods. Specifically, measures of location, shape, and dispersion were calculated using the entire sample of 595 hospitals, that is, with no outliers having been removed. No attempt was made, at this point, to deal with missing values.⁴

Exhibit 3 reports the statistics for each dependent measure, that is, for pure charity care (PURE), uncompensated care (UNCOMP), unreimbursed care (UNRE), and total charity care.

⁴ Due to missing values, however, the sample size for the statistics on the independent measures has been reduced to $N = 562$.

EXHIBIT 3

DESCRIPTIVE STATISTICAL MEASURES OF DOLLARS OF CHARITY CARE⁵

	PURE	UNCOMP	UNRE	TOTCHA
Mean	57,219	1,925,636	6,278,633	7,633,478
Median				
SDev	845,864	2,087,014	5,913,033	6,943,656
Min	0	0	0	0
Max	7,643,583	5,031,727	32,588,880	0

N = 562

Source: Data adapted from the 1987 AHA Annual Survey

The data in Exhibit 3 indicate that, as would be expected, pure charity care (PURE), the most conservative dollar measure, has the smallest mean ($\bar{X} = 57,219$), while the total charity care measure (TOTCHA) has the largest mean ($\bar{X} = 7,633,478$). Similarly, the pure charity care measure has the smallest spread of the four measures ($s = 845,864$), while the measure of total charity care has the greatest variability ($s = 6,943,656$). Clearly, the variance for all four of the measures is quite large.

The average amount of total charity care is 133 times the average amount of pure charity care; almost four times the average amount of uncompensated care (UNCOMP); and 1.2 times the average amount of unreimbursed care (UNRE).

The average amount of unreimbursed care is almost 110 times the average amount of pure charity care; 3.2 times the average amount of uncompensated care; and 82 percent of the average amount of total charity care.

⁵Figures are rounded to the nearest dollar.

The average amount of uncompensated care is almost 37 times the average amount of pure charity care; approximately 31 percent of the average amount of unreimbursed care; and 25 percent of the average amount of total charity care measure.

The average amount of pure charity care constitutes less than 3 percent of the average amount uncompensated care; .9 percent of the average amount of unreimbursed care; and less than .8 percent of the average amount of total charity care.

Clearly, charity care, when measured as pure charity care, constitutes only a fraction of all the financially quantifiable care that Catholic hospitals provide at no or reduced cost to a patient, but for which the hospital is not fully or partially compensated. Moreover, at least in terms of average amounts, it is clear that the method of measurement makes a substantial difference in the level of the contribution that a Catholic nonprofit hospital makes to the community as part of its charitable mission.

The percentile rankings for the four charity care measures, computed after charity care dollars had been normalized to account for differences in the size of hospitals,⁶ also demonstrate how the use of one measure or another results in a different picture of the distribution and levels of charity care across Catholic hospitals.

⁶ The data must be normalized to account for the differences in the size of hospitals. In this case, charity care dollars were normalized by taking charity care as a percentage of three measures of the volume of hospital activity: (1) adjusted patient day; (2) adjusted admissions; and (3) staffed beds.

EXHIBIT 4

FOUR DIFFERENT CHARITY CARE MEASURES⁷

NORMALIZED TO ACCOUNT FOR DIFFERENCES IN HOSPITAL SIZE

Charity Care Dollars Per Adjusted Patient Day

	PURE	UNCOMP	UNRE	TOTCHA
25th%ile		12	42	56
50th%ile		19	72	87
75th%ile		30	102	122
100th%ile	35	92	325	364

Charity Care Dollars Per Adjusted Admission

	PURE	UNCOMP	UNRE	TOTCHA
25th%ile	13	81	301	392
50th%ile	32	138	500	606
75th%ile	58	202	696	831
100th%ile	282	738	3291	3593

⁷Rounded to the nearest dollar.

EXHIBIT 4

(continued)

	Charity Care Dollars Per Staffed Beds			
	PURE	UNCOMP	UNRE	TOTCHA
25th%ile	474	3224	11267	15099
50th%ile	1283	5795	20778	25536
75th%ile	2525	8928	29961	36333
100th%ile	11312	29886	97593	106544

The normalized measures for all the measures of charity care again illustrate the fact that some hospitals are doing very large amounts of charity care, while other hospitals are doing very little. However, an even better illustration of the unequal distribution of charity care can be found in the economic measures of the Lorenz curve and the Gini coefficient.

Typically, economists rely on the Lorenz curve to depict graphically the inequality of income distribution in the United States. A second measure of inequality, derived from the Lorenz curve, is the Gini coefficient. Both measures can be adapted to measure the inequality of charity care burdens across hospitals.

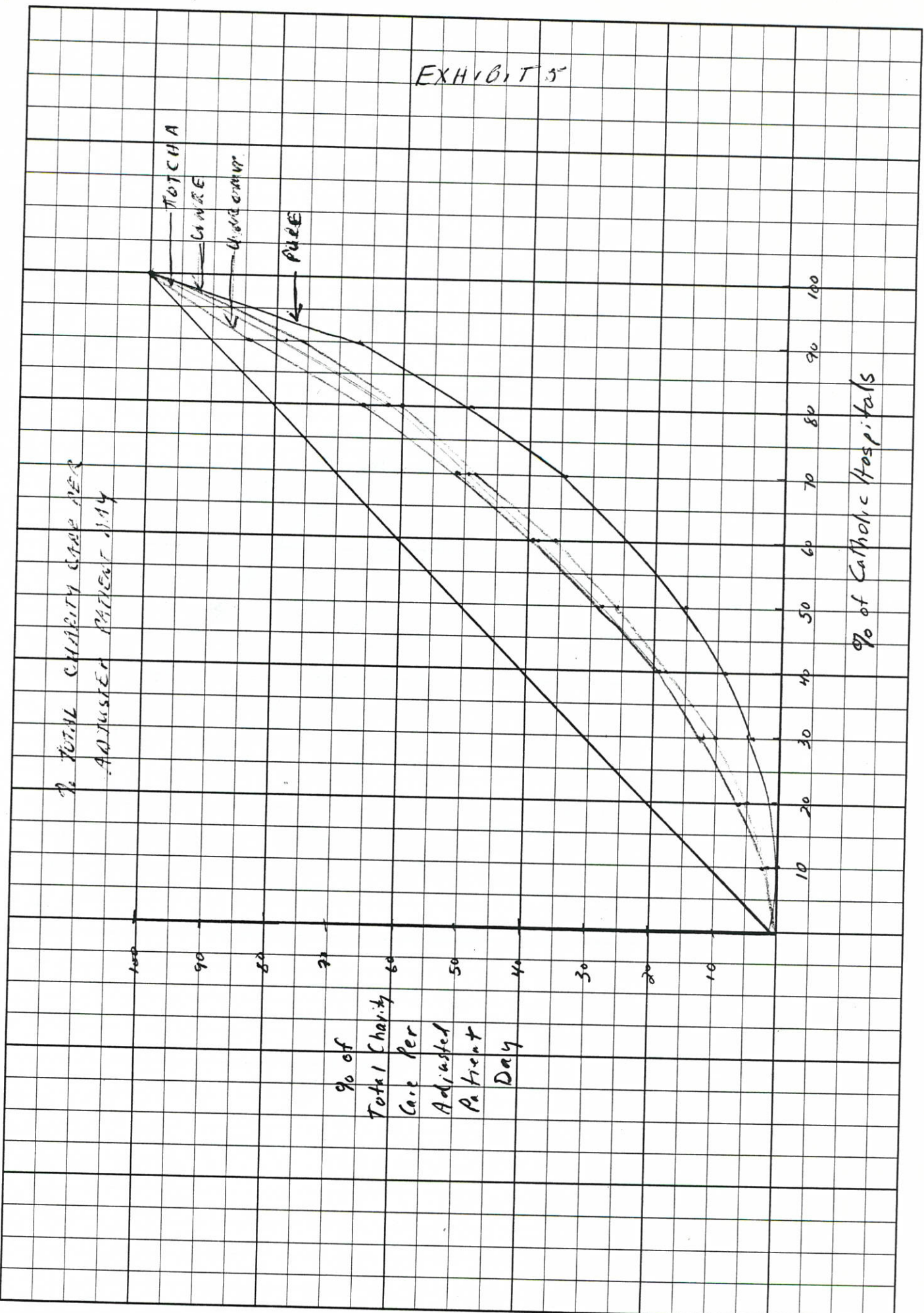
For income distribution, the Lorenz curve records

...the cumulative percentage of the population (from 0 to 100 percent) along the horizontal axis and cumulative percentage of total income (starting with the lowest) along the vertical axis. If income were distributed perfectly equally, the Lorenz curve would be a diagonal straight line showing that any (say) 10 percent of the population receives 10 percent of total income. Inequality in actual income distribution is indicated by the curve's being bowed below the diagonal. The more unequal the distribution, the more extensive will that bowed effect be (Nicholson, p. 661).

The Lorenz curve measure can be adapted to measure the inequality of charity care burdens by changing the measures on the horizontal and vertical axes. Again, however, the data must be normalized to account for the differences in measurement units for large and small hospitals. In this case, charity care dollars were normalized by taking charity care as a percentage of three measures of the volume of hospital activity: (1) charity care per adjusted patient day; (2) charity care per adjusted admissions; and (3) charity care per staffed bed.

Having normalized charity care dollars to account for the wide variation of health care activity across Catholic hospitals, the cumulative percentage of charity care dollars for each of the four different measures of charity care was then plotted on the vertical axis. The horizontal axis, by contrast, depicts the cumulative percentage of sample hospitals from 0 to 100 percent. Exhibits 5 through 7 illustrate the unequal distribution of charity care, however measured, given various methods of normalizing the data.

EXHIBIT 5



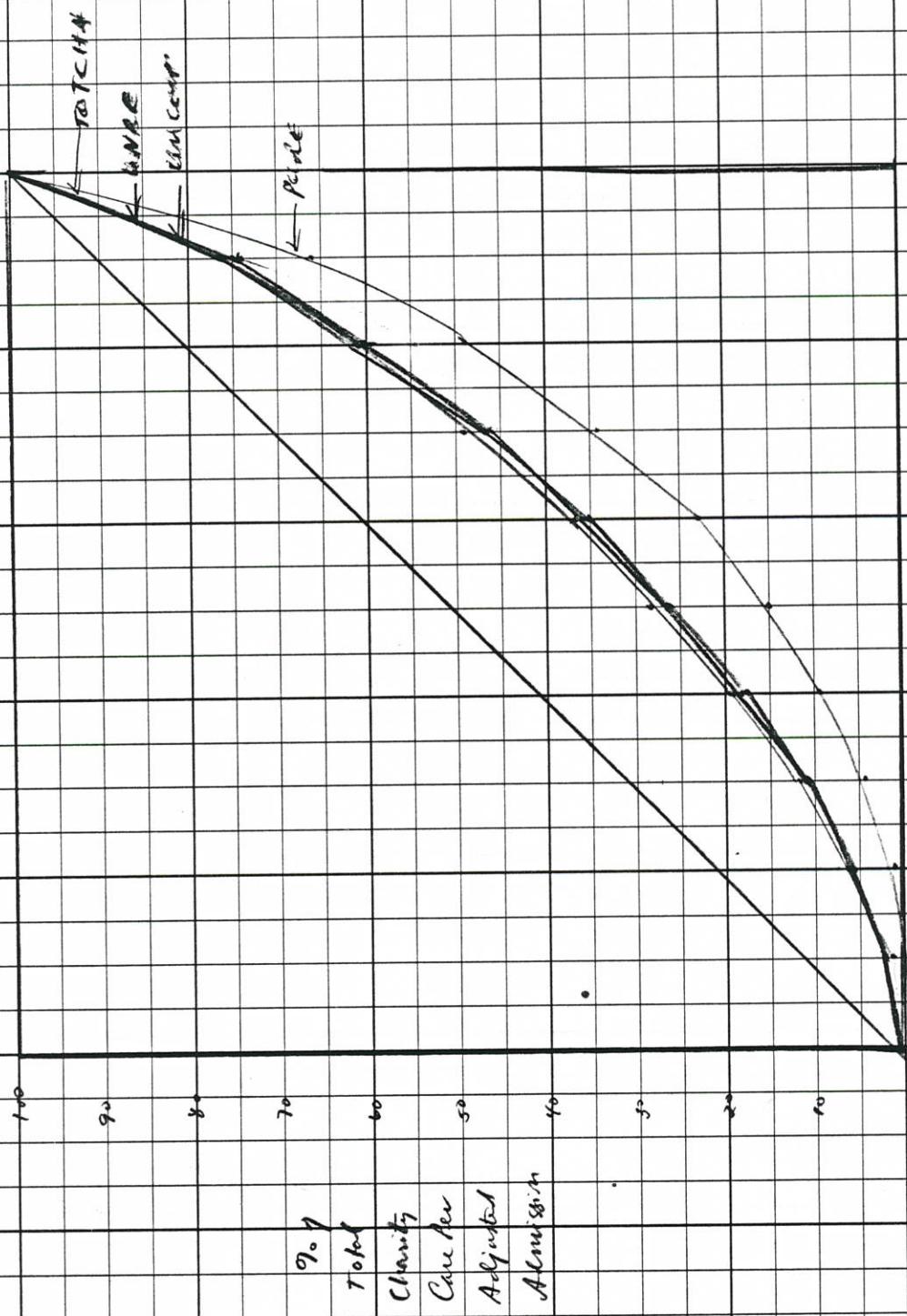
% TOTAL CHARITY CARE PER
ADJUSTED PATIENT DAY

% of Catholic Hospitals

% of
Total Charity
Care Per
Adjusted
Patient
Day

EXHIBIT 6

2 TOTAL CHARITY CARE
PER ADJUSTED ADMISSIN



7.7 Catholic Hospitals

As Exhibits 5 through 7 indicate, there is clearly an unequal distribution of charity care across the sample of Catholic hospitals. This unequal distribution is evident regardless of the way charity care has been normalized. In fact, different normalization methods seem to have little effect on the shape of the curves.

In each case, the most unequal distribution of charity care is reflected by the pure charity care measure. Taking the most generous normalization method for that measure, that is, pure charity care per adjusted patient day, the Lorenz curve indicates that 50 percent of the Catholic hospitals in the sample do approximately 15 percent of all pure charity care. Eighty percent of the hospitals account for approximately 50% of all pure charity care.

Viewed in a different way, the Exhibit 5 shows that 20 percent of the Catholic hospitals in the sample account for approximately 50 percent of all pure charity care. Even more dramatic is the fact that 10 percent of all the hospitals in the study approximately 34 percent of all pure charity care.

The curves of the measures of total charity care, uncompensated care, and unreimbursed care, while similar one to another, differ markedly from the pure charity care curve. Looking at Exhibits 5 through 7, the similarity among these three measures of charity care and their contrast to the measure of pure charity care becomes quite obvious. Specifically, the inequality of the distributions of total charity care, uncompensated care, and unreimbursed charity care is substantially less than the inequality of the distribution of pure charity care. For example, Exhibit 7 shows that while 50 percent of all hospitals contributed only 15 percent of all pure charity care, the other three measures recorded that 50 percent of all the hospitals in the sample contributed between 26 to 28 percent of all charity care. Eighty percent of

the hospitals contributed between 60 and 67 percent of all charity care, when measured as total charity care, uncompensated care, or unreimbursed care. This stands in contrast to the 50 percent of the charity that sample hospitals contribute when the measure is pure charity care. Ten percent of the hospitals contribute between 16 and 24 percent of all charity care when measured as total charity care, uncompensated care, or unreimbursed care.

The Gini coefficients for each of these measures also indicate that, in general, the burden of charity care is unevenly distributed across the sample. Moreover, the coefficient also reinforces the similarity among three of the measures of charity care, and their difference with the pure charity care measure.

The Gini coefficient is calculated as follows:

$$\text{Area A} / (\text{Area A} + \text{Area B}),$$

where Area A is the area below the 45° angle, but above the Lorenz curve, and Area B is the area below the Lorenz curve, but above the horizontal axis. The Gini coefficient hypothetically ranges from 0 (perfect equality) to 1 ("absolute" inequality -- that is, one person [or hospital] gets all the income" (Nicholson, p. 661).

Exhibit 8 gives the Gini coefficients for each of the charity care measures, given different normalization methods.

EXHIBIT 8

MEASURES OF INEQUALITY IN THE DISTRIBUTION OF CHARITY CARE:

THE GINI COEFFICIENT

Normalization Methods

	Per Adjusted Patient Day	Per Adjusted Admission	Per Staffed Bed
TOTCHA	.315	.323	.334
UNCOMP	.288	.342	.359
UNRE	.343	.346	.355
PURE	.496	.500	.510

Like the Lorenz curve, the Gini coefficient reflects the fact that the measure of pure charity care is the most unequally distributed across the sample, and that this measure differs substantially from the other three measures. For the most part, the inequality reflected in the other three measures is fairly similar, irrespective of normalization method. The most noticeable difference among the total charity care, the uncompensated care, and the unreimbursed care measures, is the uncompensated care measure when normalized per adjusted patient day. Using this normalization method, the uncompensated care measure is slightly less than the other measures of charity care. Moreover, it is slightly less than measures of uncompensated care that have been normalized per adjusted admission or per staffed bed.

What are the implications of these differences? While it is not clear why uncompensated care seems to be more sensitive to the adjusted patient day type of normalization method, the difference between pure charity care and the other three measures of charity care suggests that the same model might not do

as well in predicting variation in charity care levels across all four measures.

What are some of the factors that might account for the variation in charity care measures, especially the difference between pure charity and the other three measures? The descriptive statistics, some of which were used as independent variables in the four multiple regression models of charity care, reveal that the majority of hospitals in the sample (27%) are located in the East North Central census region of the country. Only slightly less than 4 percent were located in the East South Central region. In fact, it is in the South and the Mountain Regions that the fewest number of Catholic hospitals in the sample are found.

The majority of Catholic hospitals (66%) are located in counties where there are public hospitals. Eighteen percent are located in rate-setting states. Most (67%) do not have a Hill-Burton obligation. Also, the majority of Catholic hospitals are located in moderately competitive counties where, on average, there are 13 competitor hospitals per county. The average public aid payment where Catholic hospitals are located is moderately generous -- \$1928.

In terms of the factors that serve as proxies for the pervasiveness of the religious influence, the sample showed that on average, Catholic hospitals are served by nine members of religious congregations (SERVHOSP); that have a lay CEO more often than not (62%), and that 77 percent have a sponsorship program designed to promote the mission of the hospital in its daily operations. The vast majority -- over 94 percent of the Catholic hospitals in the sample -- are sponsored by religious congregations as opposed to having diocesan or archdiocesan sponsors. Moreover, most hospitals are served by

moderately-sized religious congregations having, on average, a total membership of 354.

In terms of the communities in which Catholic hospital are located, the majority are in areas where approximately 8 percent of the population are children four years of age and under (PCHILD, \bar{X} = 7.7%); where adults over 65 constitute about 13 percent of the population (POVER65, \bar{X} = 13.4%); and where minorities comprise about 15 percent of the population (PMINOR, \bar{X} = 15.5%).

On average, the Catholic hospitals in the sample tend to be located in areas where the unemployment is slightly higher than the national norms (PNOWORK, \bar{X} = 6.9%); where 15.2 percent of the population is college educated (PCOLLEGE); and where 11.5 percent are living under the poverty level (PPOVERTY). Moreover, on average, the hospitals in the sample tend to be located in areas where approximately 37 percent of the population are renters (PRENTER), and 24 percent live in multiple housing (PMULTI). Geographically, the majority of the Catholic hospitals in the sample (43%) are located in suburban areas. The remainder are almost equally split between urban and rural areas -- 28 and 29 percent, respectively. The average mortality rate across Catholic hospitals, using HCFA figures for 1988, was 12.4 percent.

A look at the organization and resources of Catholic hospitals reveals that, on average, there are approximately 264 staffed beds in each hospital. The average number of employees that staff the Catholic hospitals in the sample is 733 full-time equivalents (FTEs). Of these employees, Catholic hospitals have, on average, 167 FTE nurses and 4 FTE physicians.

The vast majority of Catholic hospitals -- 98 percent -- have a 24-hour emergency room. In addition, 65% of the facilities in the sample have an AIDS

unit or programs, a program which is likely to draw a high percentage of indigent patients. Most Catholic hospitals are members of a multi-hospital system (77%). Only 31 percent sponsor an AMA residency program; 28% are affiliated with a medical school; and 8% are certified teaching hospitals.

While there are a number of measures of the volume of hospital activity, some of which previously have been used to normalize measures of charity care to compare as percentiles, the measure of total facility admissions, adjusted admissions, total facility patient days, and adjusted patient days are among the most common. In this sample, these measures are highly correlated with each other, and so probably can be used interchangeably.

A comparison of the measures shows that, on average, the hospitals in the sample recorded 8,937 total facility admissions and provided 65,119 total facility days of service. Adjusted figures are somewhat higher: 10,998 adjusted admissions, or 1.23 times the number of total facility admissions; and 77,917 adjusted patient days, or 1.2 times the number of total facility patient days.

The average number of Medicaid inpatient days for the sample was 7,110. Predictably, the average number of Medicare inpatient days (29,057) was substantially greater than the number of Medicaid patient days -- four times greater for this sample.

The section that follows incorporates data for both the independent and dependent measures. Using multiple regression models and associated inferential statistics, the model relating levels of charity care to four sets of independent variables that had been specified previously, will be estimated.

ESTIMATING THE REGRESSION MODELS THAT RELATE LEVELS OF CHARITY CARE
TO THE FOUR SETS OF DEPENDENT VARIABLES

Three sets of equations for each measure of charity care were estimated to determine the effects of missing values and outliers. Subsequently, an estimation procedure using mean substitution and removing statistical outliers was chosen.⁸

Analysis of Goodness of Fit

Each of the four sets of explanatory variables were entered into the equation as a group in the following order: first, the characteristics of the policy and market environments; second, the characteristics of the local population; third, the characteristics of the health care delivery system; and fourth, the characteristics of the religious sponsors. Of these four groups of explanatory variables, the characteristics of the local population

⁸ The first equation was estimated using list-wise deletion of missing data (N = 533). The second equation was estimated using mean substitution. The third equation was estimated using mean substitution for missing values and, after the first run, removing outliers approximately 3.5 standard deviations beyond the mean. The results of each equation yielded comparable results. That is, the correlation coefficients between the dependent and independent variables, the Adjusted R², the Beta weights, and the measures of statistical significance for the entire equation, and for the individual coefficients, were very similar, if not the same.

Once having selected the second estimate procedure as a method for dealing with missing values, the entire equation was tested against the assumptions of linearity, constant variance, independence of the error terms, and normality. In the initial stages of the analysis, however, the linearity and normality assumptions appeared to be violated, as one might expect with cross-sectional expenditure data. For example, a plot of the charity care measures against the independent interval-level data revealed an exponential pattern. Moreover, when a plot of the residuals revealed a problem of heteroscedasticity. These problems were corrected by taking the natural logarithm of the dependent variables, and of the independent variables that reflected the size of the hospital, such as the number of staffed beds (LG87.156).

and the characteristics of the health care delivery system accounted for most of the variance across all four models, although these two sets of variables did not do as well accounting for the variance in LGPURE model as in the other three models.

The analysis of the statistical significance of the contributions of each of the four sets of variables as they were entered into the model, a procedure which does not necessarily illustrate whether these variable sets were substantively significant, showed that each set of variables had a statistically significant impact on the equation except the religious factor variable set. This set of variables, which included the numbers of sisters and brothers who served in the hospital in 1985, and a dummy variable for whether the CEO of the hospital was a member of a religious congregation, did not result in a statistically significant change in the F-statistic at the .0000 level. This was true, irrespective of charity care measure, which ranged between .2843 for the LGPURE model, and .6998 for the LGTOTCHA model.

Nevertheless, taken together, the four sets of explanatory variables accounted for a large proportion of the variance in levels of charity care for three of the measures of charity care: total charity care (LGTOTCHA: Adjusted $R^2 = .7152$); uncompensated care (LGUNCOMP: Adjusted $R^2 = .7152$); and unreimbursed care (UNRE: Adjusted $R^2 = .7150$). As one might have expected from the look of the Lorenz curves, the model did not do as well in explaining the variation in levels of pure charity care (LGPURE: Adjusted $R^2 = .3456$). Exhibit 9 presents these figures, and other statistics for the entire equation.

EXHIBIT 9

THE INDEPENDENT MEASURES OF CHARITY CARE:

SUMMARY STATISTICS FROM THE ESTIMATED MULTIPLE REGRESSION MODEL

	LGTOTCHA	LGUNCOMP	LGUNRE	LGPURE
Adj.R ²	.7845	.7152	.7150	.3456
St. Error	.5831	.7259	.6655	2.3633
Sign of F.	.0000	.0000	.0000	.0000
N	590	592	592	577
Deg Freedom	562	564	564	559

The statistics in Exhibit 9 indicate the entire equation is statistically significant for the four independent measures at less than the .01 level. The standard errors are small for all of the models except the pure charity care model. For this model, the standard error is substantially larger (LGPURE, SE = 2.3633) than for the other models. The standard errors for the other models range between .5831 for LGTOTCHA, to .7259 for LGUNCOMP.⁹

⁹ The large standard error for the LGPURE estimation reflects some of the problems with the data. Specifically, almost 30 hospitals reported that they did no pure charity care whatsoever. Further analysis of these cases indicates that these \$0 reportings were not missing values, but rather real dollar amounts reported by the hospitals.

What is not clear from an analysis of these cases, however, is whether these hospitals simply did not have any accounting procedures to separate pure charity care from bad debts, or whether these hospitals, in reality, did no pure charity care whatsoever. In the first case, pure charity care will be underestimated; in the second case, the measure would be an accurate report of the hospital's pure charity care activity.

Either case causes problems with the data analysis. If the \$0 values are correct, the log of the pure charity care variable results in an undefined value which is set to a system missing value by most statistical packages. To avoid losing these case, I recomputed the pure charity care figure for hospitals that reported \$0 of charity care by setting \$0 = \$1. Then I took $\ln(1) = 0$, and that

Analysis of the Regression Coefficients

As hypothesized for the LGTOTCHA model, PMINOR, MORTAL, PRENTER, U87.67 (emergency room), RMULTI (multi-hospital system), COMBASED (community-based programs), C87.384 (teaching hospital), RNPERBED, COMPETE, and LG87.156 (natural logarithm of number of staffed beds) were positive, and the coefficient of AID (public aid level) was negative. Of these variables, AID, COMPETE, PMINOR, COMBASED, RNPERBED, and LG87.156 were statistically significant at the .05 level. Relative to the other variables, AID (Beta weight = $-.18545$), RNPERBED (Beta-weight = $.22601$), and LG87.156 (Beta weight = $.61261$) contributed to the greatest change in levels of total charity care.

Somewhat surprisingly, the coefficients of, RPUBLIC, PPERCAP, RURAL, and SUBURB were positive when they were hypothesized as negative. Also surprising

0 figure was used throughout the analysis. However, when regressions were then run using $\ln(\text{PURE})$, most of the 0 values nevertheless became extreme negative outliers -- most as many as 5 or 6 standard deviations from the mean. Moreover, the distribution of residuals, while normally distributed, was clustered closely around the mean, with very few residuals in either tails of the distribution.

A second regression was run deleting the extreme outliers -- about 20 in number. The resulting regression had an improved fit (Adjusted $R^2 = .345\%$ as opposed to and Adjusted $R^2 = .245\%$ for the first regression), and the distribution of the outliers improved somewhat.

For purposes of comparison, a third regression was run deleting the \$0 cases -- approximately 30 cases from the sample. This resulted in a much better distribution of the residuals and a model that explained a larger proportion of the variance (Adjusted $R^2 = .461\%$).

Having compared results of the three regressions, I decided to use the second approach because it was the same technique that was used to estimate the equations for the other measures of charity care, that is, using mean substitution and removing outliers greater + 3.5 standard deviations beyond the mean. To throw out all \$0 value cases, especially when this value could accurately reflect the level of pure charity care in a hospital, clearly seemed to inject a bias into the sample. Obviously, however, I cannot be totally comfortable with this procedure because I have tossed out approximately 20 outliers, all of which were negative, and all of which were reported for hospitals that reported \$0 of pure charity care. For these reasons, the results from the LGPURE charity care model must be interpreted with considerable caution.

were the coefficients of SERVHOSP and RRELLAY, which were both negative when they were hypothesized to be positive. Exhibit 10 provides the regression statistics for the LGTOTCHA estimation that illustrate these findings.

EXHIBIT 10

REGRESSION STATISTICS OF THE TOTAL CHARITY (LGTOTCHA)

Variable	B-Value	Beta Weight	SEB	Significance F
COMPETE	.00029	.07616	.00011	.0027
RPUBLIC	.04367	.01669	.06550	.5053
AID	-.00004	-.18545	.00000	.0000
PMINOR	.50741	.06998	.21839	.0205
PPERCAP	.00000	.01442	.00000	.5644
RURAL	.07639	.02754	.11376	.5022
MORTAL	.00057	.00068	.02065	.7763
PRENTER	.41713	.04814	.26607	.1176
SUBURB	.05623	.02224	.07406	.4480
U87.67	.13679	.01325	.21458	.5241
RMULTI	.07285	.02403	.06350	.2519 *
COMBASED	.11672	.07919	.03186	.0003
C87.384	.06875	.01508	.10685	.5202
RNPERBED	1.09274	.22601	.11568	.0000
LG87.156	.91655	.61261	.05295	.0000
SERVHOSP	-.01897	-.01726	.00036	.4541
RRELLAY	-.00024	-.00049	.05495	.8151
Constant	9.25130			

An analysis of the B-Values in Exhibit 10 reveals that, holding other factors constant, a one-unit change in the number of competitors in a county has a minuscule positive impact on a hospital's total charity care. Minuscule impacts on LGTOTCHA were also estimated for increases in the average public aid payment, for the average per capita income of the people living in the local community, changes in the mortality rate, and for the number of sisters or brothers working in the hospital. Specifically, a one dollar decrease in the average public aid payment results in a .00004% increase in total charity care; a one dollar increase in the average per capita income yields a less than .00001% increase in total charity care; a one hospital increase in the number of competitor hospital results in a less than a .00004% decrease in the level of total charity care, and a one person increase in sisters of brothers results in a .00027% decrease in total charity care. Further, a 1 percent increase in a hospital's mortality rate has a .00059 percent increase on the level of total charity care.

Moderately substantial impacts on levels of total charity care were estimated for a hospital's being located in a county where there is a public hospital (.04367% increase); a hospital's being located in a suburb as opposed to another area (.05623% increase); a hospital's being located in a rural area as opposed to another area (.07639% increase); a hospital's having an emergency room (.13679% increase); a hospital's being part of a multi-hospital system (.07285% increase); a hospital's being a teaching hospital (.06875% increase); for a hospital's having a lay CEO (.01277 decrease); and, for a one program increase in the number of community-based programs, a .11672 increase.

Four factors have a substantial affect on levels of charity care. Specifically, a 1 percent increase in the numbers of minority people in the

hospital's local community increases the amount of charity care by over .50741 percent. Similarly, a one percent increase in the percentage of renters in the area increase charity care by slightly over .41713 percent. Two factors that characterize the resources of the hospital, however, had the greatest impact on levels of total charity care: the number of nurses per bed (1.09274% increase), and the number of staffed beds (.99236% increase).

The statistical findings for the LGUNRE model are fairly similar to the LGTOTCHA estimation, although there were some interesting changes in directions where they had not been anticipated. As hypothesized for the LGUNRE model, the coefficients for the PMINOR, MORTAL, PRENTER, RMULTI, COMBASED, C87.384, RNPERBED, and LG87.156 were positive. Of these variables, MORTAL, COMBASED, RNPERBED, and LG87.156 were statistically significant at the .05 level. However, somewhat surprisingly, the coefficients of COMPETE and U87.67 were negative when they were hypothesized to be positive, and AID, RPUBLIC, PPERCAP, RURAL, and SUBURB were positive when they were hypothesized to be negative. Of those where the direction was not the one that been hypothesized, only COMPETE and AID were statistically significant at the .05 level. Once again, the coefficients of SERVHOSP and RRELLAY, neither of which were statistically significant, were both negative when they were hypothesized to be positive.

Exhibit 11 provides the regression statistics for the LGUNRE estimation that illustrate these findings.

EXHIBIT 11

REGRESSION STATISTICS OF THE UNREIMBURSED CHARITY (LGUNRE)

Variable	B-Value	Beta Weight	SEB	Significance F
COMPETE	-.00004	-.21024	.00000	.0011
RPUBLIC	.04311	.01659	.07152	.5469
AID	.00039	.08783	.00012	.0000
PMINOR	.41890	.05735	.23602	.0764
PPERCAP	.00000	.03268	.00000	.2269
RURAL	.04091	.01499	.12219	.7379
MORTAL	.05170	.06289	.02110	.0146
PRENTER	.20466	.02359	.28274	.4695
SUBURB	.03153	.01254	.07942	.6915
U87.67	-.03114	-.00032	.21956	.8872
RMULTI	.06811	.02276	.06824	.3186
COMBASED	.13985	.09505	.03463	.0001
C87.384	.00046	.00010	.11487	.9677
RNPERBED	1.12398	.23915	.12188	.0000
LG87.156	.91369	.57912	.05700	.0000
SERVHOSP	-.00006	-.00042	.00039	.8689
RRELLAY	-.05781	-.02244	.05934	.3303
Constant	9.09817			

An analysis of the B-Values in Exhibit 11 reveals that the addition of one hospital to the number of competitors in a county has a minuscule impact on a hospital's total charity care (.00004 decrease). However, in terms of

the Beta-weights, the impact of the COMPETE variable relative to the other variables is quite substantial (Beta weight = $-.21024$). Minuscule impacts on LGUNRE were also estimated for increases in the average public aid payment ($.00039\%$ increase); for the average per capita income of the people living in the local community ($.00000\%$); for the number of sisters who serve in the hospital ($-.00006\%$); and for a hospital's being a teaching hospital ($.00046\%$).

Moderately substantial impacts on levels of total charity care were estimated for a hospital's being located in a county where there is a public hospital ($.04311\%$ increase); for a hospital's being located in a suburb or in a rural as opposed to an urban area ($.03153\%$ and $.04091\%$ increases, respectively); for a hospital's having an emergency room ($.03114\%$ decrease); for a hospital's being part of a multi-hospital system ($.06811\%$ increase); for a hospital's having a member of a religious congregation for a CEO ($.057816\%$ decrease); and, for a hospital's having a one percent increase in its mortality rate ($.05170$). Also, a one program increase in the number of community-based programs increased total charity levels by $.13985\%$ percent.

Four factors have a substantial affect on levels of unreimbursed charity care. Specifically, a one percent increase in the number of minority people in the hospital's local community increases the amount of charity care by almost $.42$ percent. Similarly, a one percent increase in the percentage of renters in the area increase charity care by slightly over $.20$ percent. As in the LGTOTCHA estimation, two factors that characterize the resources of the hospital, however, had the greatest impact on levels of total charity care: the number of nurses per bed (1.12398% increase in the B-value; $.23195$ increase in the Beta-weight), and the number of staffed beds ($.91369\%$ increase in the B-Value; $.57912$ increase in the Beta-weight).

The statistics for the LGUNCOMP model, similar to the LGUNRE estimation, indication some directional relationships that had not been anticipated. For example, while the coefficients for the AID, PMINOR, RURAL, MORTAL, PRENTER, U87.67, RMULTI, COMBASED, C87.346, RNPERBED, LG87.156, and RRELLAY variables all went in the hypothesized direction, COMPETE , RPUBLIC, PPERCAP, SUBURB, and SERVHOSP did not. Of all the variables, AID, PPERCAP, PRENTER, U87.67, RMULTI, COMBASED, RNPERBED, and LG87.156 were statistically significant at the .05 level.

Exhibit 12 provides the regression statistics for the LGUNCOMP estimation to illustrate these findings.

EXHIBIT 12

REGRESSION STATISTICS OF THE UNCOMPENSATED CARE (LGUNCOMP) MODEL

Variable	B-Value	Beta Weight	SEB	Significance F
COMPETE	-.00009	-.01831	.00013	.4954
RPUBLIC	.01188	.00042	.07810	.8791
AID	-.00004	-.16408	.00000	.0000
PMINOR	.48062	.06022	.25750	.0625
PPERCAP	.00000	.05372	.00000	.0471
RURAL	-.06852	-.02297	.13265	.6057
MORTAL	.00038	.00042	.02307	.8699
PRENTER	.90152	.09425	.31034	.0038
SUBURB	.04745	.01730	.08646	.5834

EXHIBIT 12

(continued)

Variable	B-Value	Beta Weight	SEB	Significance F
U87.67	.54854	.05200	.23943	.0223
RMULTI	.15780	.07424	.04845	.0340
COMBASED	.09799	.06073	.03790	.0100
C87.384	.21982	.04372	.12555	.0805
RNPERBED	1.11713	.21692	.13300	.0000
LG87.156	.94203	.54764	.06209	.0000
SERVHOSP	-.00045	-.02648	.00043	.8988
RRELLAY	.00082	.00029	.06467	.2911
Constant	9.32526			

An analysis of the B-values reveals that all but seven variables have virtually no or minimal impacts on levels of charity care. Those factors which has substantial impacts on the level of uncompensated care include PMINOR (B-value = .48062); PRENTER (B-value = .90152); U87.67 (B-value = .54854); RMULTI (B-value = .15789); C87.384 (B-value = .21982); RNPERBED (B-value = 1.11713); and LG87.156 (B-value = .94203). Of these variables, PRENTER, U87.67, RMULTI, RNPERBED, and LG87.156 were statistically significant at the .05 level. Three other variables having relatively little substantive impact on the level of uncompensated care, were also statistically significant: AID, PPERCAP, and COMBASED. An analysis of the Beta-weights shows that AID, RNPERBED, and LG87.156 have the greatest influence in the equation relative to the other variables.

The estimation for pure charity care (LGPURE), differs substantially from the other models. While many of the same variables were statistically significant at the .05 level as they were for other models (for this model, AID, PRENTER, RMULTI, COMBASED, RNPERBED, and LG87.156 were each statistically significant at the .05 level), RPUBLIC, PMINOR, RURAL, U87.67, RMULTI, PRENTER, COMBASED, C87.384, RNPERBED, and LG87.156 all yielded a greater than .18% increase on the level of pure charity care. However, relative to the other variables, AID, PRENTER, and Lg87.156 had the greater impacts on levels of charity care. Exhibit 13 provides these figures.

EXHIBIT 13

REGRESSION STATISTICS OF THE PURE (LGPURE) CHARITY CARE MODEL

Variable	B-Value	Beta Weight	SEB	Significance F
COMPETE	-.00061	-.05817	.00044	.1598
RPUBLIC	-.18057	-.02963	.25805	.4844
AID	-.00008	-.17355	.00002	.0000
PMINOR	.26684	.01565	.85047	.7538
PPERCAP	.00000	.01496	.00000	.7195
RURAL	.46553	.07283	.43793	.2882
MORTAL	-.06855	-.03587	.07552	.3645
PREENTER	2.90328	.14093	1.04017	.0054
SUBURB	.13910	.02359	.28478	.6254
U87.67	.34244	.01531	.77993	.6608
RMULTI	.56976	.08062	.24767	.0218
COMBASED	.27467	.07938	.12451	.0278
C87.384	-.28381	-.02607	-.41549	.4949
RNPERBED	1.10474	.09984	.44203	.0124
LG87.156	1.68214	.45761	.20316	.0000
SERVHOSP	-.01189	-.03249	.01411	.2003
RRELLAY	-.24669	-.04088	.21252	.2462
Constant	2.39733			

Catholic Hospitals and Their Mission: A Summary

An analysis of the data for four measures of charity care reveals that some Catholic hospitals are doing very well while other hospitals are doing very little. There is clearly a wide variance in charity care levels across Catholic hospitals for all four measures of charity care. Moreover, the distribution of charity care across the sample is relatively unequal, especially if the pure charity care measure is the measure of choice.

Pure charity care constitutes a very small part of all the types of charity care a Catholic hospital may provide. If this measure were to be adopted, Catholic hospitals would appear to be doing very poorly in their mission to serve the poor. If one of the other three measures were to be adopted, the picture would improve significantly. Of these three measures, the picture improve most dramatically when the costs of contractual shortfalls for Medicare and Medicaid are included in the equation.

What explains the variation in these measures of charity care? Of the four sets of variables that were examined, the characteristics of the local population and the characteristics of the health care delivery system contributed most significantly to the explanation of the variance. The characteristics of the market and policy environments also contributed significantly to the explanation of the variance. The characteristics of the religious sponsor, however, did not make a significant contribution to the model. Thus, it is not possible to reject the first three hypotheses that were tested in this research. However, it is possible to reject the hypothesis that the influence of the sponsoring congregation has little statistically significant and, for that matter, substantively significant, influence on levels of charity care. Analyzed as individual variables, however, the

estimations revealed that different independent variables were statistically significant in different equations. Generally speaking, however, the resources of the organization, modeled through the number of nurses per bed and the number of staffed beds, had different the strongest impact on levels of charity care, and the largest impact relative to the other variables.

BIBLIOGRAPHY

A bibliography will be provided at the workshop. My apologies!

