

## 健康維護組織之財務分析—以 Rochester 地區為例

劉宜君\*

### 摘要

去(2002)年相當賣座且感人至深的電影「迫在眉梢」中，男主角丹佐華盛頓(Denzel Washington)遭遇困窘的經濟狀況，偏偏獨子罹患嚴重的心臟病，不盡快換心就無法活下去，然而他的醫療保險公司(HMO)不能為他支付金額龐大的手術費用，最後在走投無路的情況下，丹佐華盛頓只好封鎖醫院急診室綁架病人，希望能藉此迫使醫院接受他的愛子進行心臟手術。本片雖然親情至深，但是更披露出美國社會福利制度的不完善與醫療保險的缺失，其中健康維護組織(Health Maintenance Organizations，簡稱 HMOs)的給付範圍為引發爭議的關鍵因素之一。

在美國實施頗為有成效的 HMOs，過去曾為國內健康保險研究學者與專家所引進。HMOs 的最大的優點為論人頭計酬，比傳統的論次計酬(Fee-for-service)制度更能有效控制醫療成本，並促進醫療供給者之間的競爭，醫療院所會主動提供被保險人保健服務，防患疾病於未然，節省約略 25%的醫療費用。根據學者實證分析發現 HMOs 減少財務負擔的主要關鍵，在於減少住院率與住院日數。

台灣學者對於健康維護組織的討論焦點較著重於文獻探討與方案研究，本研究以實證分析健康維護組織的財務影響，並以美國紐約州羅徹斯特地區(Rochester)之 HMOs，作為健康維護組織財務影響的研究個案，探討 HMOs 的成長如何有效減緩該地區住院成本的增加，Rochester 在美國保險醫療專家眼中係一顆耀眼的明珠，該地區推動 HMO 的成效也曾為前美國總統柯林頓推動健康保險改革的模範。本研究發現 HMOs 確能降低該地區被保險人之門診率與住院日數，以減少醫療費用。最後，提出臺灣在全民健保政策改革可參考 HMO 制度原則的政策建議與配合因素。

關鍵詞：健康維護組織、全民健康保險、論次計酬制度、群體醫療

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## **An Analysis of Financing of Health Maintenance Organizations—Case Study in Rochester Area**

I-chun Liu

### **Abstract**

The story of movie “John Q.” is to describe when John Q. Archibald (Academy Award-winner Denzel Washington) cannot afford and his health insurance will not cover when his son needs an emergency heart transplant operation. Finally, he takes the emergency room hostage in order to keep his alive. His health insurance company is an HMO.

As the medical care cost is rising, health maintenance organizations (here after HMOs) are generating interest among health policy makers as an alternative to control expenditures. There is evidence available from a number of empirical studies; the results consistently show HMO enrollees as having the lowest total medical costs. Due to their incentive to contain health care costs, HMOs are prudent buyers of services that are needed for their subscribers including hospital services. In searching for the ways to reform the national health system, Taiwan's researchers have expressed their interests in promoting HMO approach to become parts of national health insurance system. Many scholars and specialists discussed HMO's concept and its policy implications. Specifically, this study focuses on empirical analysis of HMO's financing.

The focus of this paper is how the growth of HMOs, which is one of the competitive initiatives, has affected hospital cost inflation. According to American medical experts' opinions, Rochester is seen as a jewel in a sea of health-care despair. Thus, I use US's Rochester HMO model as my case study. The study finds that the growth of Rochester HMOs led to less hospital utilization and lower expenditures when compared to New York State. The policy analysis recommends: the government

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may consider a proposal to provide the option of adopting HMO's principles to control medical expenditures.

**Key words :** Health Maintenance Organizations(HMOs), National Health Insurance, Fee-for-service System、 Group Practice



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## 健康維護組織之財務分析—以 Rochester 地區為例

劉宜君

### I. Introduction

The story of movie “John Q.” is to describe John Q. Archibald (Academy Award-winner Denzel Washington) cannot afford and his health insurance will not cover when his son needs an emergency heart transplant operation. Finally, he takes the emergency room hostage in order to keep his alive. His health insurance company is an HMO.

Health maintenance organizations (here after HMOs) have introduced a novel innovation in American health insurance system: incentives for physicians not to treat patients. If a medical practitioner practices less, the company makes more. The principle is similar to pay farmers not to grow crops. HMOs make money by not providing a product. This is a new way that medical care specialists found to trade lives for money. It is called "Managed Care". For past decades, managed care was the most rapidly growing industry in America, outpacing computers and cable TV.

As the medical care cost is rising, HMOs are generating interest among health policy makers as an alternative to control expenditures. There is evidence available from a number of empirical studies; the results consistently show HMOs enrollees as having the lowest total medical costs. Apparent differences in total expenditures may be traced to lower rates of hospitalization. In U.S., since the early 1960s, total costs for HMO enrollees have grown at a lower rate than for people with conventional insurance plans. The financial appeal of HMOs is their medical costs, that is, about 25 percent lower than in the fee-for-service system. Researchers have emphasized that savings were achieved largely by a 40 percent reduction in annual hospital admissions and hospital days (Ware et al., 1986: 1017).

The focus of this study is how the growth of HMOs, which is one of the

introduce the background of the issue and the purpose of the research. In Section II, I will describe background of HMOs and present some researchers' findings. In Section III, I will review selected empirical studies concerning the determinants of hospital costs and utilization. In Section IV, I will describe the data and the regression model of the case study, which also contain a summary of the estimated the financial effects of HMOs on hospitals, followed by concluding discussion and remarks. Finally, I will present a brief summary and policy recommendations in Section V.

### 1. Background

Because HMOs function as health care financing and delivery mechanisms, the financial environment of the health care system is potentially relevant to HMO development in America. Their development may be influenced by the willingness of hospitals to serve as health care delivery resources for HMOs, or possibly by the degree to which HMOs can provide an attractive alternative to high community-wide hospital utilization rates. There is clear evidence that total medical care costs are lower for HMO enrollees than for comparable people with conventional health insurance. HMO enrollees do have a somewhat higher rate of ambulatory visits. The key to lower total costs in HMOs seems to be in the lower hospital utilization rate. In previous studies, these factors have been substituted by bed-of-population ratios, occupancy rates, and measures of days and discharges per 1,000 persons in various communities (Anderson et al., 1985: 30-31).

If HMOs offer their enrollees' insurance coverage at a lower premium rate and these enrollees switched from other insurance programs, then other providers will face pressure and change to reduce health care costs. As such, the presence of HMOs has accelerated changes in prices and in utilization for both the HMO and non-HMO populations. Therefore, it is worthwhile to examine some evidence concerning the HMO cost-containment effect and the HMO-induced competitive effect.

### 2. Research Issues

It is believed that the delivery of services on a prepaid basis will reduce costs because suppliers faced with the true cost of their services will respond by providing a

health of their enrollees in the least costly manner. To clarify the policy issue, I will present the previous studies concerning HMO "savings," cost and utilization of services. Also, I will submit various explanations about how such "savings" are achieved. The research questions are as follows: Do the HMOs in the Rochester area use fewer hospital resources relative to conventional payers? Do the HMOs lower the rate of growth in costs over time? Given the intense competition among Rochester providers, does hospital expense data suggest any evidence of cost-containment? When compared to the total utilization of hospital days in this area, the data can offer perspectives on the relative impact that HMOs may have impact on the market for hospital services.

### 3. Research Objectives

There is sufficient evidence that HMO members' experience lowers hospitalization rates and has lower total medical costs. Hospital utilization is the primary focus of HMOs attempt to control costs. The purpose of this study is to understand whether and to what degree, HMOs have affected hospital expenditures and utilization. Also, I will analyze some of the evidence concerning the competitive impacts of local HMOs. In this research, I will design a case study to analyze the financial impact of HMOs on the local hospitals in the Rochester area from 1988 to 1998. Thus, this empirical research will include the two major sections: the effects of HMOs on hospital utilization; and the impact of HMOs on hospital expenses. By keeping control variables constant, I compare hospital costs and utilization for hospitals over time under varying degrees of HMOs penetration.

### 4. Research Methods

According to several empirical studies, they showed that the financial impact of HMOs on hospitals occurs in two major parts; one is hospital cost and another is hospital use. The study approach I will use is a regression model, which assumes that the growth of Rochester HMO enrollment would lower the growth rates of the local hospital expenses. Also, the lower hospital expenses are assumed to due to lower admission rates and inpatient days. Furthermore, I use the ratios of Rochester

and health care expenses have been rising together over the past 20 years. This procedure can isolate the effect of Rochester's extra devotion to HMOs on Rochester's relative health care costs. Thus, if Rochester has greater than statewide average HMO enrollments, then we can measure whether it would acquire lower than statewide average hospital expenses. If this is in this case, then we can conclude that the growth of the Rochester HMO enrollment has caused a decrease in the area's health spending over the past two decades. I will employ a database including inpatient days, total annual hospital expenses per capita, total hospital expenses per admission, and other relevant data about HMO population in the area and New York State. After controlling for independent variables (that is, number of physicians and income level), I will assess the financial impact of HMOs on the local hospitals from 1988 to 1998.

## II. Background of HMOs Development and HMO Literature

### 1. Background of HMOs Development

For several decades, the HMO has been purposed as an alternative to the conventional fee-for-service system. Through the 1960s, the prepaid health insurance plan was seen as a method for providing employees with comprehensive inpatient and outpatient health care, including insurance coverage for ambulatory services (Saward and Fleming, 1980: 47-53).

There is available evidence that is consistent with the hypothesis that the number of HMOs has grown primarily in response to favorable market conditions and strong encouragement from U.S. federal government policy. American federal health policy has for over a decade promoted HMOs and other forms of prepaid group practices as methods of enhancing competition and potentially of reducing health expenditures. This policy appears to be having its intended effect: the number of HMOs has doubled since 1970 and the percentage of the population enrolled in HMOs has increased from 2 percent in 1970 to 7 percent in 1984 (Moore, 1991). The history of the HMO movement can be traced to early 1970. At that time there was discontent about health insurance policy: rapidly escalating costs in the Medicare and Medicaid programs; complaints of insufficient access to medical care because of misdistributions of medical providers and facilities; and accusations that medical care

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Thus, responding to demand for national health insurance and control health expenditures, America government began to promote the development of prepaid plans to achieve more efficient, but less costly medical care (Strumpf et al., 1978: 33). The Nixon administration endorsed HMOs as the new national health strategy in 1971 and pressed Congress to enact laws to encourage HMO evolution through planning grants and loans. State governments also enacted new legislation to encourage HMO development, which provided a favorable environment and new requirements on HMO participation in the health care marketplace. Passage of the HMO Act of 1973 provided the initial impetus for the growth of HMOs in the mid- and late 1970s (Birnbaum, 1976: 18-19). In 1974, federal legislation required employers to offer employees a HMO choice when they are available in their communities. As the growth of HMOs started in the late 1970s, hospitals adopted strategies to establish their own HMOs, to sign up with all operational HMOs in the market, and to selectively contract to provide services for the HMO enrollees (Thompson, 1991: 13).

In the 1970s, HMOs were the most popular in the west of U.S.; 67 percent of all HMOs were in Arizona, California, Hawaii, Colorado, Oregon, and Washington. The Midwest and East were evenly represented with five HMOs each in three and five states, respectively. In 1971, prior to the national HMO legislation, there were 30 HMOs in the United States together enrolled 3 million members.

During the 1980s, the HMO industry grew and became increasingly visible in most areas in America; a 184 percent increases since 1975 (AMA, 1982). To date, the HMO plan continues to be an important characteristic of the health care coverage of American workers. Over half of all workers covered by employer-responeded health plans have been enrolled in managed care plans. At the same time, the proportion of employees enrolled in self-insured plans declined from 45 percent in 1990 to 40 percent in 1991. The significant increase in HMO market share may have contributed to a large part of this decline, since HMO plans are more likely to be insured than self-insured (Gruber et al., 1988: 199).

As American medical care cost is rising, HMO plans became the leading topic of national conversation in the past decades. The governor of a small Southern state was elected American President after making health-care reform in a central element in his campaign. After taking office, pre-President Clinton introduced a dramatic proposal to reshape the entire American health care system, saying: " Rampant medical inflation is eating away at our wages, our savings, our investment capital, our ability to create

refused to act his proposal for radical change, because of worries that too much government control health care might make costs rise even more ([www.bcnys.org](http://www.bcnys.org)). Thus, high costs still force millions of Americans to go without coverage.

Recently, in America, as the Senate takes up proposals to define patients' rights. Republicans and Democrats each have their own plans labeled a patients' bill of rights, although there are major differences between them. In both cases, their aim is to give patients basic protections under HMOs, and other managed-care plans that have come to dominant U.S. medical care. In the end, Republicans, who enjoy a 55-45 Senate majority, are virtually certain to pass the bill they prefer -one that is more limited than the Democrats' plan but still offer many patients some new powers in dealing with their HMOs and other managed-care plans. Consumer and patient groups largely back the Democrats, although they recognize that the Democrats, as a minority party, cannot pass their own version and hope through amendments to try to work out a compromise that may not satisfy everyone but can attract enough votes to pass (Frishman, 2001).

There are a lot of American researchers and political representatives who praise HMOs for cutting medical costs. However, it seems overlook the shortcomings of the American HMO system. Currently, the public begins to concern and discuss the record of HMO's gross malpractice. Some documents and reports present a powerful object lesson about how HMO's make medical decisions and how some of those decisions ultimately cause or accelerate the death of their patients. Indeed, some incompetent physicians, hospitals, and HMOs have seriously endangered the quality of medical care that a great many Americans are supposed to receive. In other words, the lower costs may come only with some restrictions and, perhaps, some risk of reduction in quality as consumers perceive it (Frishman, 2001). Thus, given the trade-off that consumers face, HMOs will be attractive to some but not others.

In summary, during the last decades, American government has basically tried to use the competitive approach to contain health expenditures, and HMOs have been part of this strategy. The supports for HMO development include: the involvement from the federal government; states contracting with HMOs for their Medicaid programs; opportunity to contract with the American government to provide services to Medicare beneficiaries; private-sector support.

#### 1.1 Definition and Scope of the HMO Concept

In 1970, the term "Health Maintenance Organization" (HMO) was created, developed and advanced by Paul Ellwood, Walter McClure, Alain Enthoven, and

federal initiative to "restructure" the medical care delivery system. The appeal of HMOs is that they can offer their members comprehensive care at lower costs than traditional fee-for-service systems.

According to Luft's definition, an HMO includes five essential characteristics. First, the HMO assumes a contractual responsibility to provide insurers the delivery of a stated range of health care services. Second, the HMO serves an enrolled, defined population. Third, the HMO has a voluntary enrollment of subscribers. Fourth, the HMO requires a fixed annual or monthly payment to the organization that is independent of their use of health services. Finally, the HMO is assumed at least part of the financial risk or gain in the provision of services (Luft, 1987: 2). Thus, a HMO consists of an association of health care professionals and facilities that provides a specified package of health care for a fixed sum of money paid in advance for a specific care.

For the purpose of the study, I define an HMO as a composite concept to provide the health care service to a voluntarily enrolled population that pays a fixed premium that is the HMO's major source of revenue. Their services include at least ambulatory and inpatient care.

## 1.2 Types of HMOs

In general, four different HMO models—staff, group, network, and individual practice associations—can be defined based on the way physician services are organized and the method by which physicians are paid. Staff, group, and network model HMOs are often collectively referred to as prepaid group practices (PGPs). Staff model HMOs employ physicians on a full-time basis. While staff model HMOs are at risk financially for the services they provide, neither the physicians nor other personnel employed by the staff model HMO are at risk personally.

In group model HMOs (Figure 1), they provide the facility, the non-physician clinical staff, and administrative support and contracts with one large, multispecialty medical group practice for physician services. They pay the physician group a fixed capitation fee for caring for each HMO member each month.

Network model HMOs contract with more than one physician group. In contrast to group model HMOs, the physician groups supply facilities and support personnel to network model HMOs. Each physician group in the network receives a capitation payment for caring enrollees who choose to receive care from that group. Most groups continue to see non-HMO patients in addition to HMO enrollees.

The fourth type of HMO model is the individual practice association (here after

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IPA) (Figure 2). An IPA provides both insurance coverage and medical services. Physicians practicing in their own offices participate in the prepaid health care plan, charge patients agreed upon rates, and bill the IPA on a fee-for-services basis. In other words, the IPA model HMOs utilize a percentage of many practitioners' time to provide care to prepaid clients. They typically contract with a large number of solo practitioners as well as single- or multispecialty group practices. Some HMOs reimburse their physicians based on agreed-upon fee schedules or payment limits drawn from a collective account (Davis et al., 1990: 131-133). Recently some HMOs, regardless of their model type, have offered their members an "open-ended" enrollment option in which enrollees are not required to use the HMO's participating providers and may enroll or disenroll at any time. Also, HMOs provide increased flexibility to their members (Tell et al., 1984: 357-379). To date, HMOs have been most likely to establish themselves in areas with a population base or at least 1 million and a large number of working individuals concentrated in a few large firms (Davis et al., 1990: 156).

In addition, the structure of the HMO industry changes rapidly. There are at least four major trends that can be perceived. First, among all types of HMOs, IPA model HMOs has experienced the greatest increases in enrollment in the past several years. Second, affiliation among HMOs, in the form of common ownership, management, and marketing arrangements, are becoming more and more common. Third, the number of for-profit HMOs may lead to economies of scale, but it may also signal the increasing need for a large capital base to ensure financial viability. Finally, the industry compared with that of fifteen years ago, a change that could either increase or decrease the health care cost savings society would derive from HMOs in

the future.

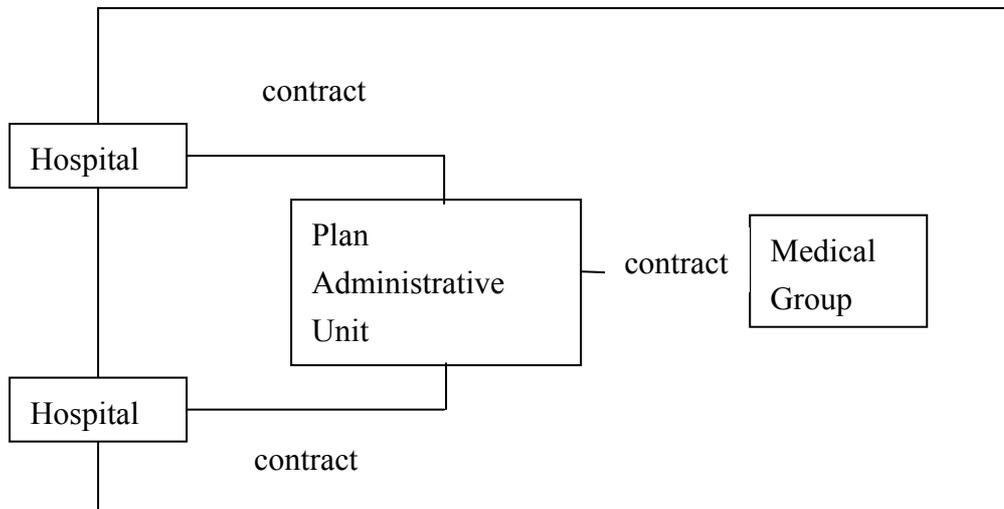


Figure 1: Prepaid Group Practice

Source: Finger Lakes Health Systems Agency, 1990

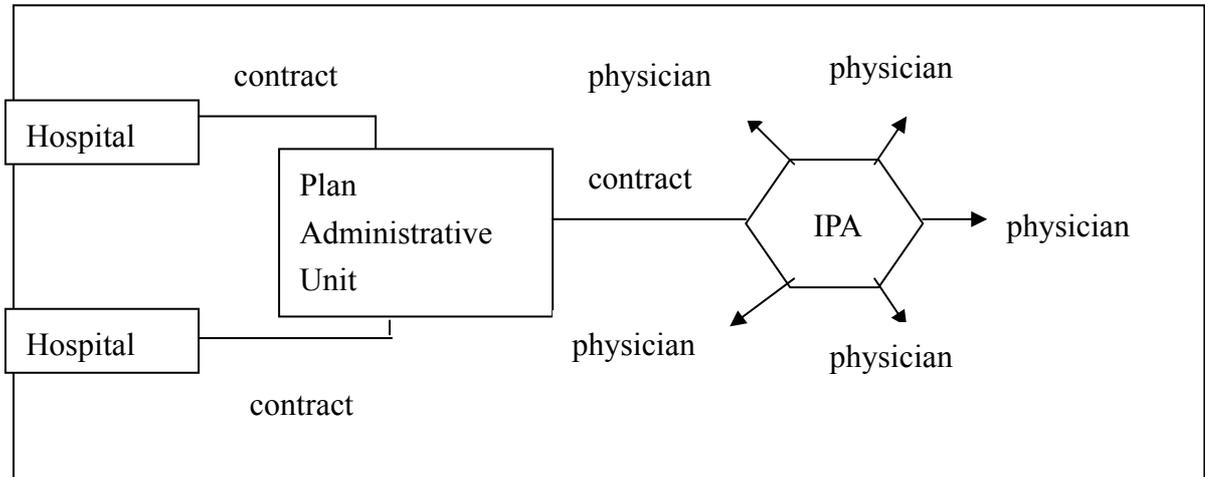


Figure 2: Individual Practice Association (IPA)

Source: Finger Lakes Health Systems Agency, 1998

## 2. The HMO Literature: Summary of Major Findings

The HMO combines a health insurance function (that is, receipt of payment for services provided for a given period of time) with the responsibility for coordinating the provision of the health care services for their members. Therefore, an HMO not only performs an insurance function, as do Blue Cross and Blue Shield plan, but also provides health care services through their own staff or contracted providers within the limits of premium income received (Hartnett, 1987: 13).

There has been much discussion about the potential cost-containing impact of HMOs on the local health care market and hospitals. There is some evidence that HMO's member experience lower medical care costs and have lower hospitalization rates than comparable groups of people. The literature evaluating the effects of HMOs in terms of their health service utilization, costs, and quality have been extensively reviewed elsewhere.

Here those major findings of HMOs' financing effects are briefly summarized.

Wolinsky (1980) reviews literature concerning HMO performance by Donabedian (1969), Greenlick (1972), Gaus(1976), and Luft (1978). He finds that the reviews agreed on the following five points. First, hospitalization rates are about 45 percent lower in HMOs than in conventional insurance plans. Second, total expenditure is less in the HMO than in that of the fee-for-service system. Third, higher levels of utilization of preventive care services in HMOs are reflective of higher levels of benefit coverage for these services than with traditional insurance systems. Fourth, HMO members are more satisfied with technical aspects of care but patients in conventional health insurance plans are more satisfied with their relationship with their doctors. Finally, quality of care is equal to or better in HMOs than under traditional health plans. All of the studies also agree that it could not be determined how lower costs and hospitalization rates of HMOs are achieved.

Also, there have been some empirical studies about competitive effects of HMOs at the community level. The most comprehensive research by McLaughlin, Merrill, and Freed (1984) use the Standard Metropolitan Statistical Area (here after SMSA) as the unit of observation and specified both HMO enrollment and hospital expenses and utilization at the level for 25 SMSAs from 1972 to 1981. They find a significant relationship between the level of HMO enrollment and hospital costs both per admission and per day. They also find that the average level of HMO penetration was associated with a 4 percent increase in total expenses per capita and per patient day, as well as a slightly higher increase in average expenditures per admission. They find increase in HMO market shares are associated with significantly

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lower admission rates, estimating that the average 6 percent market share experienced in those SMSAs over the period studied result in a 3 percent reduction in the admission rate (McLaughlin, Merrill and Freed, 1984: 57-93).

One of the important issues in evaluating the impact and value of HMOs is whether they save money. Unlike fee-for-service systems, HMOs operate on a fixed budget, provide physicians financial incentives to control costs, and encourage physicians to hospitalize less often as well as reduce the use of marginal tests and procedures (Goldberg and Greenberg, 1981: 421). There exist substantial data suggesting that HMOs in the past have provided health care at a lower total cost than did fee-for-service providers. Some studies (like those by Paul Ellwood, Walter McClure, and Alain Enthoven) assert that HMOs manage health care and gain large market shares by containing costs through fixed budget financing, as well as reduce hospitalization rates by keeping patients out of hospitals and using fewer resources once patients are admitted.

Luft's (1978) review indicates: First, total costs for HMOs' enrollees are 10 to 40 percent lower than those for comparable people with traditional health insurance plans. Second, the rates of change in HMO costs per unit of service are not significantly different from national trend. Third, enrollees in HMOs have about as many ambulatory visits as comparable groups. Fourth, most of the cost differences are attributable to hospitalization rates about 30 percent lower than conventionally insured populations. Finally, these lower hospitalization rates are due to almost entirely to lower admission rates; the average length of stay shows little difference (Luft, 1978: 1336).

According to Rossiter and Langwell (1988), HMO's sources of savings include: reduction in service use compared to fee-for-service levels; efficiencies in the provision of services that are not achieved by fee-for-service providers; and finally negotiated price discounts from providers below fee-for-service levels. Through these mechanisms, HMOs may be able to provide appropriate quality care to their members at a cost considerably below 95 percent of the adjusted average per capita cost (Rossiter and Langwell, 1988: 130; Spragins, 1997; Connolly, 1997).

However, Tyson's empirical study does not find that HMOs have not resulted in a reduction in hospital prices and costs. He describes the implications of his research for

the competitiveness of the hospital market. In other words, the demand for HMOs can instill competition in the health care market (Tyson, 1991).<sup>1</sup>

In summary, according to some of the previous studies, HMOs do reduce hospital admissions; this lower admission rate is responsible for the fewer hospital days per 1,000 population experienced by HMO members. Therefore, total medical care expenses are generally lower for HMO enrollees than for comparable persons with other coverage (Davis et al., 1990: 177; Morre, 1991: 35; Berkman, 1997; Frishman, 2001).

### III. Case Study: HMOs Experience in the Rochester Area, U.S.A.

For several decades, the Rochester area had a history of aggressive health planning and community interest in the health care delivery system. In the area, the local Blue Cross and Blue Shield plan serves more than 90 percent of the working population. This represents the greatest market penetration in the nation. Moreover, with the exception of the General Motors plant, all companies have a single community-rated premium, a situation indeed unlike that of most areas in which each firm obtains a premium based on the utilization experience of its own employees. By using alternative outpatient services to manage utilization and reduce unnecessary inpatient care, the local physicians and the health care providers work together to keep health care expenditures down. Also, community health planning decreases capital expenditures and makes the maximum use of existing facilities. Therefore, health care costs and health insurance premiums in this area continue to be well below the national average (Blue Cross and Blue Shield of the Rochester Area, 1989: 1).

#### 1. Overview of the Rochester HMO Growth and Development

Rochester was the first mid-size city in the East or Midwest of America to develop HMOs. Since the 1970s, Rochester has led the country in the establishment of managed care organizations, which have coordinated the activities of multiple

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<sup>1</sup> Recently, the annual double-digit cost increases of the late 1980s and early 1990s went away in the middle year of this decade. Some researchers consider that largely because of the success of managed care. In other words, HMO or managed care plans have achieved most of the cost savings that were one of many political opinion leaders' goals (The New York Times, 1997).

providers to achieve efficient health services. At first, these HMOs provided health care only to employer group members. Late in the 1970s, such organizations were developed to provide comprehensive home care services for two special populations: ill elderly persons who would otherwise need to enter nursing home, and terminally ill persons who would otherwise be in acute hospitals or nursing homes (Taylor, 1987: 14).

In the table 1, I summarize the HMOs and hospitals in the area and outlines Rochester HMOs enrollment trends. In the table 2, I compare HMO enrollment growth and health expenses of U.S. vs. the Rochester area.

Table 1: Comparison of HMO Enrollment Growth in the United States vs. the Rochester Area

Year	U.S. (Millions)	Annual rate of growth(percent)	Rochester (Thousands)	Annual rate of growth (percent)
1988	10.2	12.1	71	20.3
1989	10.8	5.9	87	22.5
1990	12.5	15.7	106	21.8
1991	15.1	20.8	142	33.9
1992	18.9	25.2	256	80.3
1993	23.7	25.4	332	29.7
1994	28.6	20.7	416	25.3
1995	30.3	5.9	433	4.1
1996	31.9	5.3	466	7.6
1997	33.1	3.8	526	12.9
1998	33.6	1.5	551	4.8

Table 2: Comparison of National Health Expenditures vs. Rochester Hospital Expenses

Year	National Health Expenditures Amount (billions)	Annual rate of growth (%)	Rochester hospital expenses (Thousands)	Annual rate of growth(%)
1988	288.5	15.8	401.1	11.4
1989	323.8	12.2	396.5	-1.1
1990	356.1	9.9	395.5	-0.3
1991	386.9	8.6	415.6	5.1
1992	422.6	9.2	434.7	4.6
1993	454.8	7.6	494.7	13.8
1994	494.1	8.6	577.8	16.8
1995	546.0	10.5	606.3	4.9
1996	602.8	10.4	634.1	4.5
1997	666.2	10.5	654.0	3.1
1998	678.3	10.5	655.7	3.7

National HMO research has shown that strong business support is an important factor in HMO success. In Rochester, the business attitude toward HMOs was cooperative, but neutral during the early years of regional HMOs. The business's responses to local HMO development have shifted markedly to positive endorsement and support of HMOs. The support from employers had made a powerful force to the growth of Rochester's HMOs. Also, local changes in health care benefit package have been an important factor in the recent rapid enrollment in Blue Choice, Preferred Care, and the Monroe Plan component of the Rochester Health Network plan. The low premiums make HMOs, with expanded benefits and lower risk, much more attractive relative to Blue Cross and Blue Shield plan. The rate of growth in Rochester HMO enrollments closely paralleled national trends up to the rapid growth spurt in their enrollments beginning in 1990. Most of the enrollment growth has occurred in the IPA model plans. Recently, the local HMO's popularity continues to grow as more people recognize that its managed method to health care provides comprehensive coverage at an affordable price.

In brief, three elements have encouraged Rochester region to develop the health care system: First, the widely shared community responsibility for the health care of all residents have encouraged the cooperation-between providers, and between

providers and payers. The level of corporate commitment in this regional health policy is much higher than in other areas of the country. That is the area's significant innovation to deal with community problems.

Second, in the 1930s, local industries' decision to advance Blue Cross and Blue Shield as the major health insurer and to apply a community-rate for all employer insurance, which gave these industries and their health insurers a direct stake in regional health costs.

Finally, the local health planning organization have provided the incentive, and the expertise for the community health programs that have enhanced access and affordability of health care in this area. Currently, all relevant elements of the local specific approach to health care are still working.

## 2. Methodology of Study

There is evidence available from a number of previous studies, it consistently shows prepaid group practices as having the lowest total medical costs. Researchers also emphasized that apparent differences in total expenditures may be traced to lower rates of hospitalization (Luft, 1978: 1336). Thus, the financial impact of HMOs on hospitals occurs in two major parts; one is hospital cost and another is hospital use. In the study, I will use a regression model, which assumes that the growth of Rochester HMO enrollment would lower the growth rates of the local hospital expenses, when compared to expenses in all of New York State. In addition, I use the ratios of Rochester variables to the statewide averages to control for the fact that HMO enrollment and health care expenses have been increasing together over the past two decades.

## 3. Data Description

The database I will employ includes hospital expenses per capita, hospital admission per 1,000 population, and other relevant data about HMO enrollment in this area and New York State. After controlling for independent variables (i.e., number of physician and personal income), I will assess the financial impact of HMO enrollment growth on the local hospitals in the Rochester area from 1987 to 1997. This is a time-regression on 18 annual observations.

The definition and the data source of all variables used in this analysis are listed in Table 3.

Table 3: Definition and Statistical Sources of Variables

Variable	Definition (mean of the Rochester area, New York State)	Sources
HMO	percent of population enrolled in HMOs (17.67,9.91)	Finger Lakes Health Systems Agency
TEPOP	total annual hospital expenses per capita, deflated (432.52, 724.62)	AHA annual surveys
ACDAY	average hospital expenses per patient day, deflated (121.91, 350.39)	AHA annual surveys
ACADM	average hospital expenses per admission deflated (2998.29, 4869.23)	AHA annual surveys
ADMPO P	total annual admissions per 1,000 population (150.77, 151.99)	AHA annual surveys
CENSUS	annual average number of inpatients receiving care each day per 1,000 population(4.10, 6.24)	AHA annual surveys
INCOM E	average income per capita (9839.5, 12522.06)	New York State Statistical Yearbooks
PHY	number of patient cares physicians per 1,000 population (2.99, 2.85)	New York State Statistical Yearbooks

The database will combine published information from several sources. These sources include: InterStudy, The Bottom Line; HMO Premiums and Profitability: InterStudy, The InterStudy Edge, U.S. Department of Labor, Bureau of Labor Statistics, CPI Deflated Report; U.S. Department of Commerce, Economics and Statistics Administration, U.S. Department of Health and Human Services, Vital Statistics of New York State, New York State Statistical Yearbooks, Hospital Association of New York State, Health Insurance Association of America, American Medical Association surveys, American Health Association annual surveys, Sales and Marketing Management Magazine, Inc., Finger Lakes Health Systems Agency, and Rochester Blue Cross and Blue Shield annual reports.

#### 4. Model Specification

In the case of the effect of HMOs on hospitals, growth of hospital costs and utilization are modeled to be functions of HMO enrollment growth. HMOs could affect total hospital costs by changing the number of hospital days utilized or changing the expenses incurred for those days. To determine the existence and magnitude of these individual impacts, I derive estimates of HMOs effects from the following equation concerning hospital utilization and expenses. The estimated regression results are summarized and presented in Appendix B.

Based on the existing literature, the following model was estimated:

Ratio of Rochester hospital variables to those of New York State =  $F$ (annual ratio of percent of Rochester populations enrolled in HMOs to that of the state-wide average, annual ratio of Rochester average personal income to that of the state-wide average, and annual ratio of numbers of patient care physicians in Rochester to that of the state-wide average).

These regression variables include HMO enrollment and other market characteristics hypothesized to affect hospital expenses and utilization rates, such as average income per capita and the number of patient care physicians per 1,000 population.

#### 5. Research Results

The estimated effects of HMO enrollment on hospital expenditures and utilization are all consistent with the results obtained by earlier researchers. The growth of Rochester HMO enrollment was estimated to lead to significantly lower spending share in inpatient care, total admission rate per 1,000 population, average hospital expenses per admission, and total annual hospital expenses per capita.

A ten percentage point increase in Rochester HMO enrollment, relative to the New York State average, causes a 0.9 percentage point decrease in Rochester's hospital expenses per capita, relative to the New York State average. As Rochester enrolls more people in HMOs than other New York State communities, it enjoys lower hospital expenses per capita than other communities.

A ten percentage point increase in Rochester HMO enrollment, relative to the New York State average, causes a 0.4 percentage point decrease in Rochester's average hospital expenses per admission, relative to the New York State average. As Rochester enrolls more people in HMOs than other New York State communities, it enjoys lower hospital costs per admission than other communities.

A ten percentage point increase in Rochester HMO enrollment, relative to the

New York State average, causes a 0.7 percentage point decrease in Rochester's admission per 1,000 population, relative to the New York State average. As Rochester enrolls more people in HMOs than other New York State communities, it enjoys less admission rates than other communities.

A ten percentage point increase in Rochester HMO enrollment, relative to the New York State average, causes a 0.6 percentage point decrease in Rochester's inpatient day per 1,000 population, relative to the New York State average. As Rochester enrolls more people in HMOs than other New York State communities, it enjoys fewer inpatient days than other communities.

Thus, the growth of Rochester HMO market share is estimated to result in statistically significant negative on increase of hospital expenses and admission rates to those of New York State. In this case study, the decrease in total expenses per capita runs in the expected direction to the hopes of HMO supporters. Specifically, this suggests that the Rochester experience might be unique, and it probably was dependent on the development of the local health care system.

In brief, the associations with lower inpatient care and higher per case hospital expenses are consistent with expectations. Rochester HMO growth has made the local residents' hospital admission and per capita cost less than the statewide averages. The results confirm to, as summarized by Luft(1981), previous studies have demonstrated that this lower admission rate is responsible for the fewer inpatient days experienced by HMO members.

## 6. Discussions and Summary

In summary, the estimated results indicate that Rochester has a higher-than-average HMO enrollment, and has lower-than-average hospital expenditure over the past several years. Therefore, the growth of Rochester HMOs led to less hospital utilization and lower expenditures when compared to New York State. Most coefficients of variables are statistically significant; the signs of the coefficients are also as expected. Thus, this study has demonstrated the potential cost-containing effect of Rochester HMOs upon the local medical care market. Indeed, Rochester experiences beneficial effects of rapid HMO growth and small rates of increase in annual hospital expenditures and utilization, when compared to New York State.

There are several alternative reasons why the statistical results are consistent with earlier findings.

First, Rochester has had aggressive health planning since the late 1940s, and traditionally has had a very low ratio of beds per capita. It also has an actively

interested group of large employers who encouraged innovation and cost control, as well as a rather unusual regional budgeting strategy.

Due in part to its low ratio of hospital beds to population, Rochester has had relatively low hospital utilization rates for many years. The hospital utilization rate of employer group HMO members has always been somewhat below the rate of those insured by the Blue Cross Plans; specifically, the growing HMO enrollment in the Rochester area lower statistically significant the region's already low hospital use rate. Indeed, Rochester HMOs have made efforts to significantly reduce hospital utilization when compared with the hospital utilization experience under Blue Cross and Blue Shield. The growth of Rochester HMO enrollment is expected to further lower the areas already low hospital utilization rate.

Second, national studies have demonstrated that the hospital experience of HMOs, by indirectly influencing the practice patterns of private physicians, is one of several factors contributing to significant declines in hospital utilization rates which have occurred in Rochester HMOs in the past two decades. If we compare national and Rochester hospital expenses (See Table 2), we can find that Rochester already has low hospital expenses for past several years.

Third, perhaps the most important potential role for HMOs is in promoting competition within the health care system; by stimulating conventional providers to restructure medical practice and insurance benefits. It is believed that HMOs have had a beneficial competitive effect, which does show up in the statistical models.

The medical literature had initially failed to show any significant differences in medical outcomes between traditional fee-for-service patient and the HMO patient until a recent study published in *The Journal of American Medical Association* on October 2, 1992. The study examined the medical outcomes of patients from several groups over a four-year period from 1986 to 1990. It was concluded that the elderly and the poor had significantly worse physical health outcomes when under the care of HMO's as compared to those cared for under a fee-for-service arrangement. However, critics of this study contend that the data reflects quality of care back in 1986-1990 which is not valid comparison today with the evolution of more rigorous quality controls placed on the HMO's and the providers (Ito, 1999). Given this consideration,

it may be worthwhile for a further study to monitor quality of care in an HMO setting and to examine any significant differences in medical outcomes between fee-for-service systems and the HMOs<sup>2</sup>.

#### IV. Conclusion and Policy Recommendations

From the empirical analysis of this case study, the estimated effects of HMO enrollment on hospital expenditures and utilization are essentially consistent with the results obtained by earlier researchers. The growth of the Rochester HMOs enrollment was estimated to lead significantly lower in spending share in inpatient care, total admission rate per 1,000 population, average hospital expenses per admission, and total annual hospital expenses per capita. Not only most coefficients of dependent variables are statistically significant, but also the signs of the coefficients are as expected. The growth of Rochester's HMOs enrollment was estimated to have a statistically significant negative impact on increase in the local hospital expenses and utilization.

Recently, the encouragement of a more competitive medical care market has received considerable attention in national health policy. In many countries, governments and employers who faced with the depressed economy may consider shift the medical market to emphasize effectiveness through competition by quality care, aggressive changes in physician practice style, and cost-containment strategies for the ambulatory services. In Taiwan, the government also faces financing pressure of National Health Insurance Program (here after NHI), and then may alter the tax code to make employees more sensitive to the cost of their health insurance or by adopting some HMO's principles in NHI.

In other words, the principal challenge for the single payer, Bureau of National Health Insurance, is to develop mechanisms to control the increasing number of outpatient services and to reduce inappropriate inpatient use. Although the HMO approach has comprehensive and advanced policy designs, it still has some problems to be further considered, if this approach would be adopted in Taiwan. The first one is the public's attitude and support toward the new financial approach. If the new financing system were unrecognized and unsupported by the general public, then the HMO approach would fail to achieve expected policy objectives. According to the

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<sup>2</sup> There are some reports that many HMOs' physicians have become angry with HMOs because of their lower reimbursement of fees, increased paperwork, and delays in granting requested tests or procedures of their patients. However, the data on quality of in an HMO is still not clear (Ito,1999).

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failure experience of referral system under NHI, the misconception and resistance of the insurers and providers were the factors of failure.

In order to make the HMO model political feasible, the government should offer thorough information prior to the implementation of the HMO model under the NHI, and specifically it should make all citizens known their rights and duties under the new measure.

The second is that the health authorities should collect health-related data, measure the public's opinions, and monitor policy outcomes on a systematic basis to ensure timely decisions and interventions of the NHI. In such way, we can empirically review and analyze the effects of the health policy reform on health care costs, quality and access. In other words, policy designs should consider cultural characteristics and patients' medical behavior in Taiwan

The third one is that the government has to establish the concept and consensus of limited resources in our society. It should be noted that the uncontrolling of health care expenditures would influence the national economic growth and the development of other policy sectors. In sum, the success of the NHI really requires the coordination and cooperation of policy stakeholders in our society.

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## Appendix A: Determinants of Hospital Expenses and Utilization

Means and Standard Deviation of Regression Variables;

Data for the Rochester

Variable	Mean	Std. Dev.
HMO1	17.66556	17.89863
INCOME	9893.5	3932.01
PHY	2.993121	0.2415966
ACADM	2998.291	1808.614
ADMPOP	150.7655	15.86133
ACDAY	121.9065	86.17962
TEPOP	432.5154	22.3495
CENSUS1	4.096423	0.9613425

N=18

Means and Standard Deviation of Regression Variables;

Data for New York State

Variable	Mean	Std. Dev.
HMO2	9.905556	2.567552
INCOME2	12522.06	5397.014
PHY2	2.854052	0.2890208
ACADM2	4869.228	3090.07
ADMPOP2	151.9875	6.857913
ACDAY2	350.3926	238.633
TEPOP2	724.6201	432.4361
CENSUS2	6.242306	0.8866254

N=18

Appendix B: Determination of Hospital Expenses and Utilization (Standard Errors in Parentheses)

Variable	B	C	D	E	F
Constant	2.57*** (1.44)	1.13* (0.89)	1.47* (1.16)	2.78*** (0.90)	1.50** (1.05)
A	-0.09*** (0.03)	-0.01 (0.02)	-0.04** (0.03)	-0.07*** (0.02)	-0.06*** (1.23)
G	-1.13* (0.93)	-0.41 (0.58)	-0.56 (0.75)	-0.85* (0.58)	-0.57 (0.63)
H	-0.86 (0.92)	-0.41 (0.57)	-0.30 (0.74)	-0.95** (0.57)	-0.28 (0.62)
R <sup>2</sup>	0.42	0.50	0.39	0.53	0.52

Notes:

A=HMO1/HMO2

B=tepop/tepop2

C=acday/acday2

D=acadm/acadm2

E=admpop/admpop2

F=census1/census2

G=income/income2

H=phy/phy2

N=18

\*\*\*Significant at 0.95 confidence level

\*\* Significant at 0.90 confidence level

\* Significant at 0.80 confidence level

