The variations in health maintenance organization (HMO) and Medicaid mortality and preventable readmissions

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THE VARIATIONS IN HEALTH MAINTENANCE ORGANIZATION (HMO) AND
MEDICAID MORTALITY AND PREVENTABLE READMISSIONS

A Thesis

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Science

in

Health Services Administration

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by

Lyndon Troy Castro

June 1997

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Approved by:

———————————————————————————   May 19, 1997
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ABSTRACT

The rising costs of health care and burgeoning

government deficits have prompted new ways to control costs,

while continuing to provide necessary health care. One

method increasingly chosen by states to achieve these

objectives is managed health care. There are many forms of

managed care organizations today. There are HMOs that

provide the financing and delivery systems under the control

of a single for-profit or non-profit organization; preferred

provider organizations consisting of providers that have a

pre-negotiated and usually discounted rate for services;

administrative service organizations that provide claims

adjudication; and managed indemnity services organizations

use case management to control costs, while providing

beneficiary freedom of choice. The common element among the

varying forms and subsets of managed care organization is

cost containment. Each form aspires to control the rate in

which health care costs are rising.

The increased enrollment of Medicaid beneficiaries into

managed health care plans, specifically HMOs, has raised

concerns about the quality of care those beneficiaries may

receive. Another concern is methods for monitoring the quality of care those beneficiaries can expect. There can be a balance between the costs of care and risk of the care with positive benefits realized from the care delivered.

For this study, 169,397 hospital cases from the 1991 California Office of Statewide Health and Planning and Development Discharge Data Set were randomly sampled. This sample represented 50% of all 1991 hospitalization cases from hospitals in the state of California.

The sampled cases were analyzed by payer type to determine whether statistically significant differences in preventable readmissions and deaths were evident. The data were controlled by race, type of diagnosis, number of diagnoses, and gender.

The overall statistical results revealed comparable mortality and preventable readmission rates between the Medi-Cal and HMO payer beneficiaries hospitalized during 1991. Medi-Cal beneficiaries experienced greater preventable readmission rates in the patient age categories of 41 and above. In these age categories, the average preventable readmission rate of Medi-Cal payer beneficiaries was 35%,

while the HMO rate was 23%, representing a difference of

12%. Moreover, the mean age of Medi-Cal readmitted

beneficiaries (38) was 20% greater than the overall mean age

of all Medi-Cal beneficiaries (32).

In the results depicting all age categories, mortality

rates were nearly equal at 1% (370) of all Medi-Cal cases

and 1.06% (297) for all HMO cases. In addition, of the Medi-

Cal preventable readmission cases (370), 30.8% (114)

resulted in death; while of the HMO preventable readmission

cases (297), 25.3% (75) resulted in death. The preventable

readmission and mortality rates, coupled together with the

lower mean age of the Medi-Cal beneficiaries (32) when

compared to the HMO beneficiaries (41), would suggest that,

for overall ages, statistically insignificant differences

between Medi-Cal and HMO beneficiaries occurred.

When these data and analyses are used as measures of

the quality of care received during hospitalizations,

overall, Medi-Cal and HMO beneficiaries revealed similar

quality of care. The HMO cases depicted similar mortality

and preventable readmission rates although the mean lengths

of stay were 8% lower for the HMO beneficiaries. Also, the

mean number of diagnoses and mean number of procedures were

similar.

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OPERATIONAL DEFINITIONS

Capitation: A method of paying for medical services on a per-person rather than a per-procedure basis. Under capitation, an HMO pays a participating doctor a fixed amount per month for every HMO member he or she takes care of, regardless of how much or how little care the member receives.

Copayment: A fixed payment the patient pays (usually in the $5 to $25 range) each time he or she visits a health plan clinician or receives a covered service.

Death: The cessation of the life of a living organism. In this research, death is synonymous with mortality; which, in this research, measures the cessation of life while a patient in a hospital. More specifically, since hospital discharge records are used, death and mortality are recorded in the discharge record as the patient disposition. The patient disposition is place to which the patient was discharged. Therefore, the patients who have died while in custody of the hospital have been discharged as a result of their death.

Deductible: More typical in traditional health insurance, a fixed amount the patient must pay each year before the insurer will begin covering the cost of care.

Fee-for-service: The traditional method of paying for medical services. A doctor charges a fee for each service provided, and the insurer pays all or part of that fee. Sometimes the patient pays a copayment for each visit to the doctor.

* *Health Maintenance Organization (HMO)*: An organization that provides health care in return for pre-set monthly payments. Most HMOs provide care through a network of doctors, hospitals and other medical professionals that their members must use to be covered for that care. The term *health maintenance organization* was first coined in the early 1970s during the Nixon administration. There are varying models of HMOs. These models include integrated organizations that provide all types of services, Point of Service (POS) models that allow varying patient cost sharing for more flexibility, and Independent Practice Associations (IPAs) which differ in how the physicians are organized and paid. Ultimately however, the objective is to control costs.

Length of Stay (LOS): The number of days residing in medical institution or hospital.

Managed Care Organization: An umbrella term for HMOs and all health plans that provide health care in return for pre-set monthly payments and coordinate care through a defined network of primary care physicians and hospitals.

Medi-Cal Payer beneficiaries: California Medicaid payer beneficiaries. Medicaid is a state-federal cost-sharing program that pays for certain health services of persons who meet eligibility criteria based on income levels determined by the states. Medicaid is under the auspices of The Department of Health and Human Services (DHHS) and Administered by Health Care Finance Administration, which was created by the Comprehensive Health Planning and Public Health Services Amendments Act of 1966. Medi-Cal is under the auspices of State of California Health and Welfare Agency and administered by the Department of Health Services.

Mortality: Death. In this research, mortality is coded in the hospital discharge record under the field 'disposition'.

Patient Payer: The patient payer in this research represents the payer plan in which the beneficiaries have indicated in their hospital records. Although patients can be underwritten by certain insurance companies or the government, the payer plan in this research is the provider plan type, which is responsible for the direction of the patient's health care services.

Payer source: Is the entity responsible for paying the health care bills. In this research, the payer sources studied are Medi-Cal (Medicaid), HMO, and all others combined. The Medi-Cal beneficiaries can be enrolled in either managed care plans or fee-for-service plans. The payer sources recorded in the hospital discharge records are used in this study to measure the effects of HMO or Medi-Cal fee-for-service plan types. It is thus the plan type, and the risks associated with the plan's enrollment that is measured in this research.

Per diem: The payment of services for a one-day period.

Point-of-Service (POS) plan: A type of HMO coverage that allows members to choose to receive services either from participating HMO providers, or from providers outside

the HMO's network. In-network care is more fully covered; for out-of-network care, members pay deductibles and a percentage of the cost of care, much like traditional health insurance coverage.

Practice guidelines: Carefully developed information on diagnosing and treating specific medical conditions. Practice guidelines, usually based on clinical literature and expert consensus, are designed to help physicians and patients make decisions, to help a health plan evaluate appropriateness, and medical necessity of care.

• *Preferred Provider Organization (PPO)*: A network of doctors and hospitals that provides care at a lower cost than through traditional insurance. PPO members get better benefits (more coverage) when they use the PPO's network, and pay higher out-of-pocket costs when they receive care outside the PPO network.

Preventable readmissions: Are defined as a rehospitalization within one month of cases with the same diagnosis and within the same hospital. The rehospitalization cases were at the patient level. Preventable readmissions, in this research, are considered

adverse outcomes because, when properly controlled, present

proximate measures of outcomes which may indicate underlying

deficiencies. Moreover, readmissions may lead to the

inefficient use of resources, greater patient suffering, and

missed opportunities.

Preventive care: Care designed to prevent disease

altogether, to detect and treat it early, or to manage its

course most effectively. Examples of preventive care include

immunizations and regular screenings as Pap smears or

cholesterol checks.

Primary care: Preventive health care and routine

medical care that is typically provided by a doctor trained

in internal medicine, pediatrics, or family practice, or by

a nurse, nurse practitioner or physician's assistant.

Primary care physician (PCP): A physician, usually an

internist, pediatrician or family physician, devoted to

general medical care of patients. Most HMOs require members

to choose a primary care physician, who is then expected to

provide or authorize all care for that patient.

Quality of care is defined by the Institute of

Medicine's (IOM) Committee to Design a Strategy for Quality

Review and Assurance in Medicare as: "Quality of care is the

degree to which health services for individuals and

populations increase the likelihood of desired health

outcomes and are consistent with current professional

knowledge. How care is provided should reflect appropriate

use of the most current knowledge about scientific,

clinical, technical, interpersonal, manual, cognitive, and

organizational and management elements of health care (Lohr

1990, 4-5).In this research, the quality of care provided to

Medi-Cal and HMO payer plans is measured as the differences

in the rates of preventable readmissions and deaths.

Referral: A formal process that authorizes an HMO

member to get care from a specialist or hospital.

To assure coverage, an HMO patient generally must get a

referral from his or her primary care doctor before seeing a

specialist.

Specialist: A doctor or other health care professional

whose training and expertise are in a specific area of

medicine, like cardiology or dermatology. Most HMOs require

members to get a referral from their primary care physician

before seeing a specialist.

CHAPTER ONE -- STATEMENT OF THE PROBLEM

Introduction

The demands of international competition, burgeoning government debts, and the high rates of health care inflation have been deleterious to the number of insured persons and the amount of funds available to those with insurance. The increased international competition forced U.S. companies to be more price-competitive. As companies sought ways to reduce costs, health care, which experienced steep inflation during the past three decades, was an increasingly prominent target for cost controls. As a large and increasing portion of federal and state budgets, health care was also targeted for cost containment. As a result, both the private and public sectors sought ways to reduce the rate of health care inflation without diminishing the quality of care the beneficiaries may receive.

This research reviews the trend to enroll Medicaid beneficiaries--specifically, California Medi-Cal beneficiaries--into Health Maintenance Organizations(HMO) and the potential implications to the quality of care those beneficiaries might receive.

The Medi-Cal populations have experienced gradual
introduction into managed care provider plans in the past;
however recently, the enrollment has progressed from
optional enrollment to mandatory enrollment. Since the
amendments to the 1935 Social Security Act that directed the
federal government to pay for health services to the over 65
population (Medicare) and the poor or disabled (Medicaid),
the programs have experienced tremendous growth in
beneficiaries and expenditures. Within two years of these
amendments, legislation to rationalize the health services
system began to materialize.

The Comprehensive Health Planning and Public Health
Service Amendments Act of 1966 (PL 89-749), sought to build
on planning processes and techniques required by the Hill
Burton Act of 1946. In 1972, Social Security Amendments (PL
92-603) were enacted to monitor the utilization and quality
of services provided under Medicare and Medicaid by using
professional standards review organizations (PSROs);
however, these PSROs were replaced by professional review
organizations.

In 1974, the National Health Planning and Resources

Development Act created greater control that planning

agencies had over health services.

As the federal and state governments became concerned

about the rate of health care inflation, methods for

reducing the rate of inflation were explored. The Tax Equity

and Fiscal Act of 1982 and the Social Security Amendments of

1983 established a prospective payment system as a method

for containing hospital costs. The rate of Medicare payments

would be paid prospectively and based on a mix of hospital

services in the form of diagnostic related groups (DRGs) and

means tested for weighting payments based on experiences by

area. Moreover, states began to control Medicaid

expenditures through arbitrary payment limits. It was the

intention of both state and federal governments to cause

hospitals to become more efficient. The need to control the

rise of health care expenditures precipitated the creation

of prospective payments, increased competition, and greater

risk sharing by health providers. (Rakich 1992)

Historically, Medi-Cal beneficiaries had the freedom of

choice to choose their providers.

However, in recent years, greater mandatory enrollment has been explored and realized. This usurpation of what had been perceived as a right by beneficiaries prompted outcries by libertarians and advocacy groups. The grass root's efforts to ensure both governmental entitlement rights and patient rights have galvanized public policy officials, government lawmakers, and health care constituents.

During the 1980s, federal legislation had sought to ease restrictions on the types of plans that could be offered to the Medicare and Medicaid populations. In more recent years, the federal government has adopted more regulations that attempt to safeguard the Medicare and Medicaid beneficiaries from the financial influences attributable to HMOs. A primary concern of government officials is that access, and thus quality of health care, may be adversely effected as the result of greater incentives to ration care based on a fixed budget.

The premises behind these federal actions stem from the belief that Medicare and Medicaid beneficiaries are disadvantaged in some way from the general insured populations and that HMOs may potentially provide care that

is deemed to be of lesser quality than the general insured population. It is the primary tenet of this research to provide results that may lend evidence about the actual differences in mortality and recidivism outcomes experienced by California Medicaid beneficiaries enrolled into HMOs.

The potential risk of enrolling Medicaid/Medi payer beneficiaries in HMOs is poor quality of health care, as measured by preventable readmission and mortality rates. This research explored the differences among the 1991 California hospitalized HMO and Medi-Cal payer cases.

Purpose of the Study and Implications

The purpose of this study was to determine whether new and current policy changes that propose to enroll greater proportions of Medi-Cal beneficiaries into HMOs, would adversely affect the hospitalization outcome risks of care provided to Medi-Cal beneficiaries.

In this analysis, I used the variations of preventable readmission and death rates between Medi-Cal and HMO payer sources (as indicated in the patient records) as indicators of outcomes and thus the quality of care. To determine whether the risks of mortality and readmission were greater

for HMO payer cases than the Medi-Cal payer cases, the

respective odds ratios and relative risks were computed.

These statistical measures compute whether excess risks

between the HMO and Medi-Cal payer sources existed.

The results of my analyses are synthesized into policy

recommendations.

Decade of Change

Health Care Costs

The U.S. health care inflation rate of 8% during the

1980s was significantly greater than the general inflation

rate of 4% during the same period. The specific inflation

rate of hospital and related services increased from 6.6% in

the 1950s and 1960s to over 11.5% in 1989.

In addition, hospitals represented 38% of total health

care costs and representing the largest single cost category

among all health care cost categories (Levit, Lazenby,

Cowan, and Letsch, 1991).

Public health expenditures, as a percentage of total

health care spending, have increased from 24.7% of overall

spending in 1965 to 42.0% in 1989. Increases in national

health expenditures as a percentage of gross national

product grew from 5.9% in 1965 to 11.6% in 1989 (Levit,

Lazenby, Cowan, and letsch, 1991).

Figure 1 Selected Consumer Price Index Trends

Selected Consumer Price Indexes (1983 = 100)
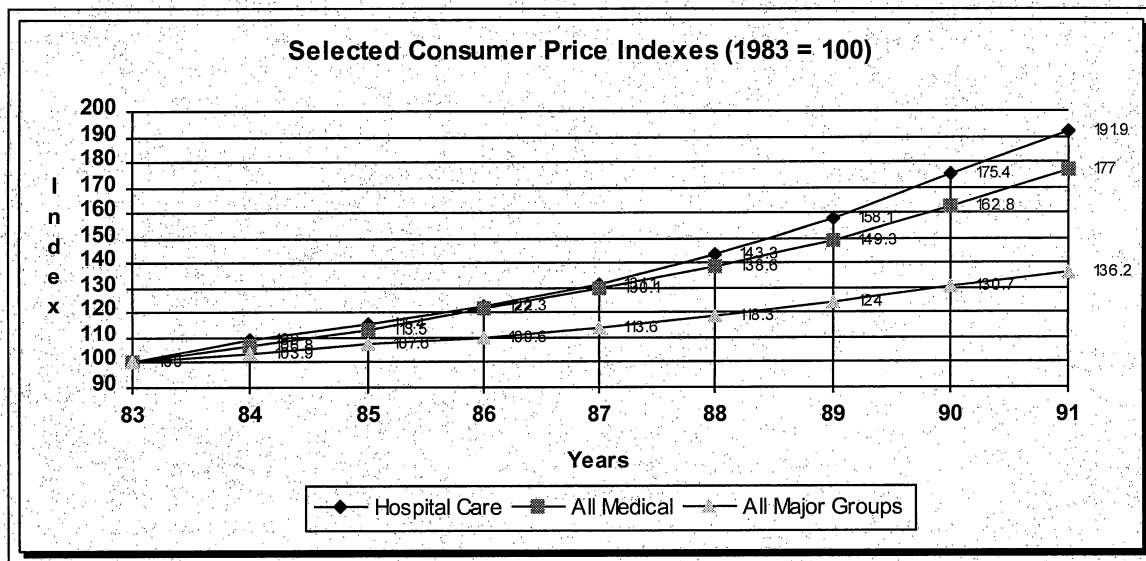
The expenditures per capita increased from 1,068 to

3,094 in 1980 and 1992, respectively.

The 1992 amount represented an increase of 290% (U.S.

Department of Commerce, 1992).

Figure 2 Health GDP for Selected Years

Health % of GDP from years 1980 - 1992

Year	Value
92	13.6
91	13.2
90	12.6
89	11.9
88	11.5
87	11.1
86	10.9
85	10.8
84	10.5
83	10.6
82	10.4
81	9.6
80	9.3
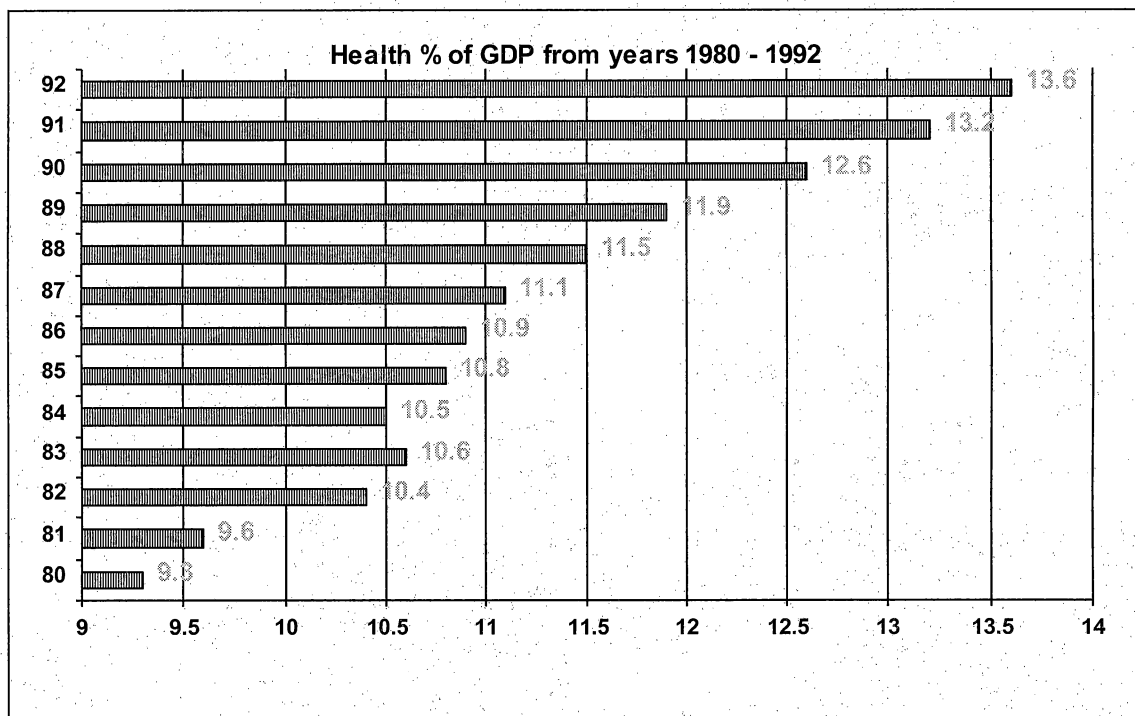
Figure 3 Health Care Expenditures per Capita for Selected Years

Health Care Expenditures per Capita

Year	Dollars
92	$3,094
91	$2,882
90	$2,686
89	$2,433
88	$2,214
87	$2,013
86	$1,871
85	$1,761
84	$1,620
83	$1,490
82	$1,369
81	$1,227
80	$1,068

Dollars

15
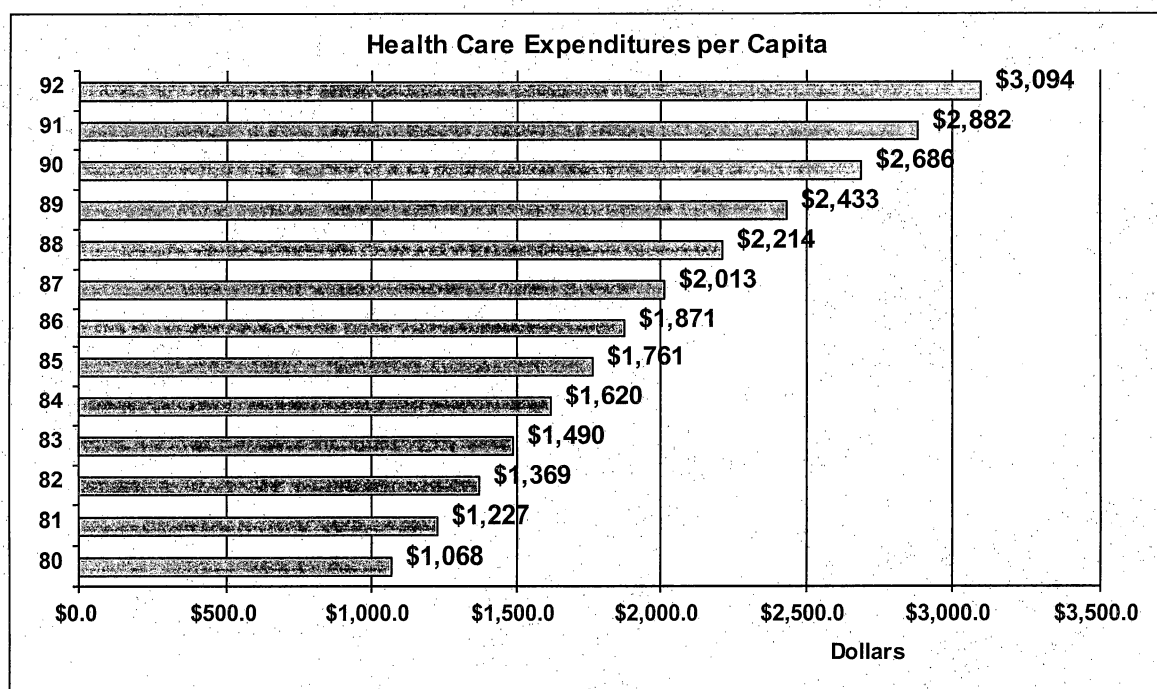
Figure 4 shows the hospital admissions per 1,000 person in the U.S. from 1980 to 1990. The decrease in admissions per 1,000 is clearly evident (U.S. Department of Commerce, 1992).

Figure 4 Hospital Admissions per 1,000 for Selected Years

U.S. Admits per 1,000
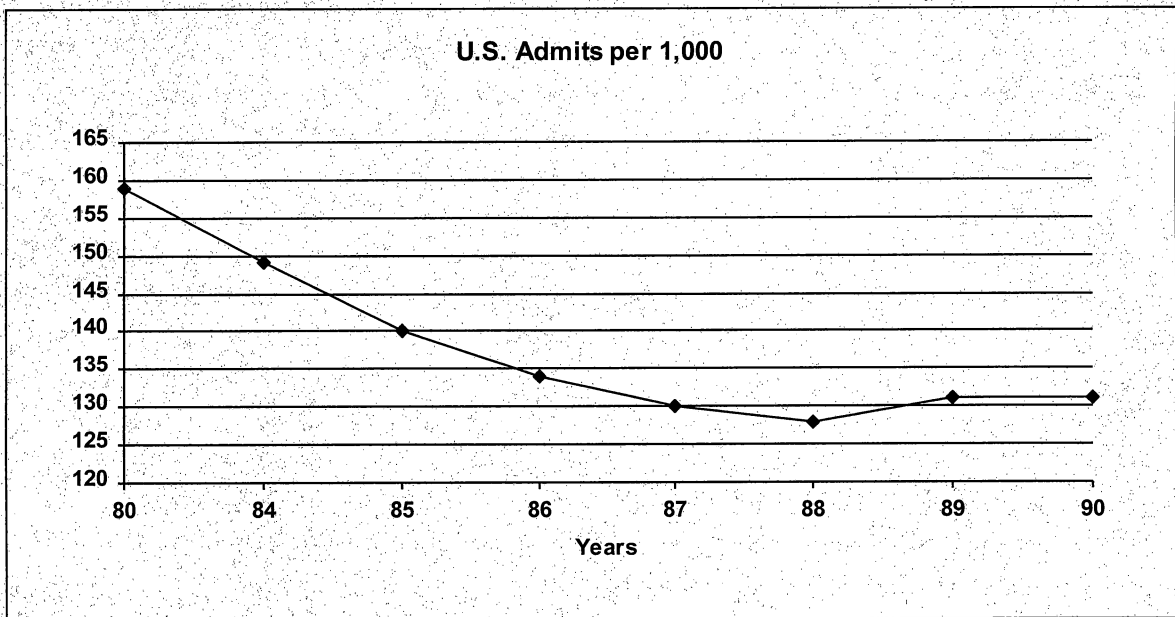
Figure 5 Outpatient Visits per 1,000

U.S Outpatient Visits per 1,000

Year	Value
80	890
84	896
85	916
86	962
87	1009
88	1095
89	1199
90	1265

Years
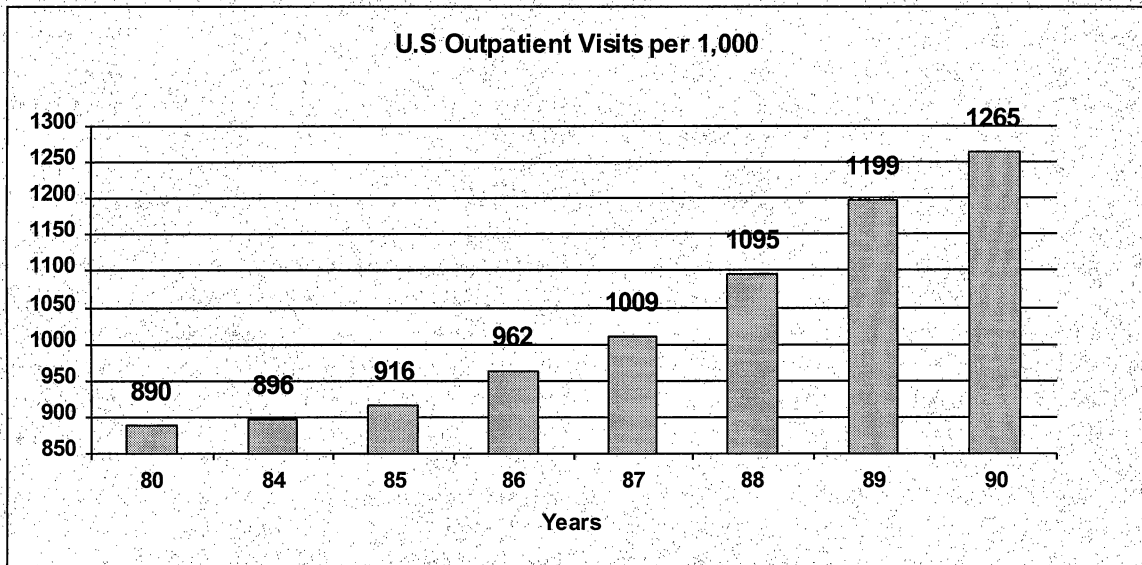
Figure 6 depicts measures of health status of the U.S. compared with California in 1990.

Although California had the highest enrolled managed care population, these health status data are favorable when compared to the national data (U.S. Department of Commerce, 1992).

Figure 6 Measure of U.S. and California Health Status

(1990)	U.S.	California	Difference CA - US	% Diff.	
Percent of Low Birth Rates	7.05	5.85	-1.2	-17.0%	
Infant Deaths per 1,000	8.9	7.5	-1.4	-15.7%	

Figure 7 shows the trend of overall and heart disease specific death rates per 100,000 from 1980 through 1991.

During this eleven-year period, overall mortality rates

improved from 585.8 to 513.7 deaths per 100,000 (12%

improvement).

Heart disease--single most costly disease in the U.S.--

deaths per 100,000 improved from 202.0 to 148.2 during the

same period (U.S. Department of Commerce, 1992).

Figure 7 U.S. Age Adjusted Death Rates per 100,000
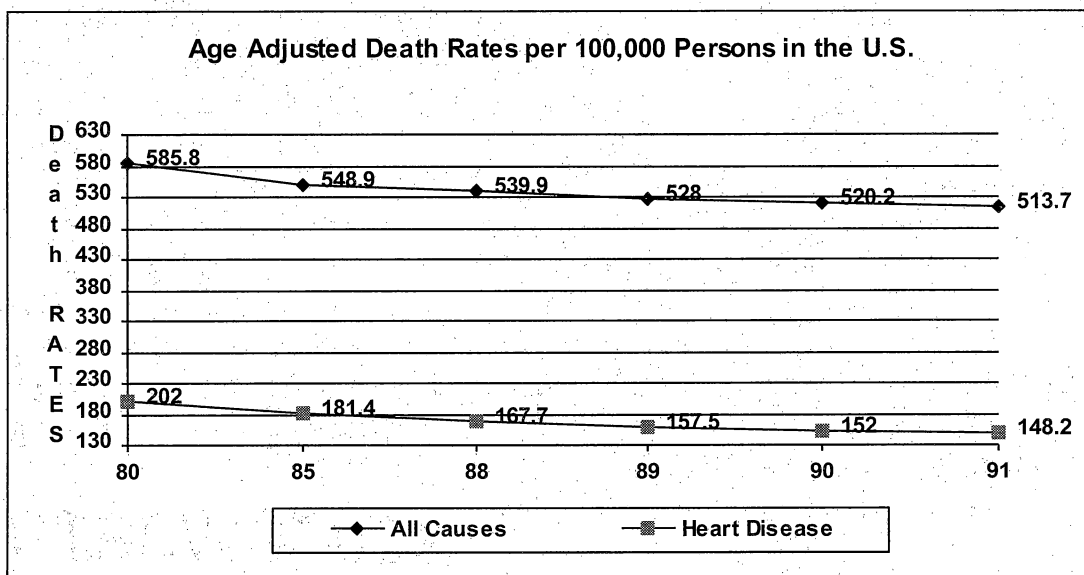
The health care rate of inflation coupled with

increases in government programs, greater entitlement

participation, and mounting concerns about government budget

deficits demanded the development and implementation of

serious cost containment measures. However, the demands for

access and the best possible quality of health care made the

development and implementation of these measures very

difficult. The scarcity of resources motivates us to choose

both how much and to whom services should be made.

Managed Care

Since 1973, the federal government has promoted

legislation to gain greater acceptance of managed care.

A major financing mechanism that has been evaluated and

demonstrated by many states is a capitated risk system. The

principles of capitated payments are payment of a fixed

amount per member per month to a provider, with the provider

assuming or sharing financial risk attributed to the care

given to those beneficiaries. In many capitated payment

arrangements, the provider is part of an IPA or medical

group, and the premium per member per month is divided among

physician services, hospital services, and certain carve-out

services such as behavioral, pharmaceutical, and vision

care. Providers typically strive for payments in excess of

costs through controlled utilization and efficient

management of the continuum of care.

Managed care is an epiphenomenon of private sector

prepaid plans dating back over 60 years. Prominent early

prepaid plans included the 1937 Group Health Association in

Washington, DC, the 1942 Kaiser Permanente Medical Care

Program, the 1947 Group Health Cooperative of Puget Sound in

Seattle, the 1947 Health Insurance Plan of Greater New York,

and the 1957 Group Health Plan of Minneapolis.

During the 1950s and 1960s, prototype prepaid

variations named IPAs (Independent Practitioner

Associations) began to arise. During the early 1970s, Health

Maintenance Organizations (HMOs) increasingly became a

significant force in the medical industry. In addition to

HMOs, Preferred Provider Organizations (PPOs) began evolving

and growing. The primary differences between the HMO and PPO

organizational forms were the lack of PPO mechanisms for

assuring cost and quality controls. Although many of the

pre-admission certification and retrospective reviews

existed between the two managed care forms, the real

difference was in the risk for the patient's health care

needs. The HMO was primarily paid per member per month and

was responsible for all levels of patient care. The HMO act

of 1973 enabled and promoted health maintenance

organizations to expand enrollment as a result of grants,

contracts, loans, and overall synergism created by

government bureaucracies (Knogsvedt, 1995).

HMOs assumed responsibility for providing a

comprehensive range of health services to enrolled

populations at a fixed premium. The HMOs were at financial

risk because the payments were a fixed amount per member,

regardless of the amount of health services used. The HMOs

would risk contract with physician groups, usually

independent physician associations (IPA) and medical groups

to provide the care for a fixed amount per member per month

after deducting their administrative and profit margins. The

majority of physicians in California today belong to some

form of organized group like an IPA. The physicians retain

some individual medical practice autonomy while sharing the

financial risks and rewards of the overall IPA. In this way,

the physicians have financial responsibility for the groups'

costs, but can cohesively negotiate for health plan

enrollees.

The physicians receive incentives to manage the care

provided to beneficiaries by sharing the risk of over-

utilization and rewards of under-utilization. This method

contrasts the traditional fee-for-service method of enticing providers to use services.

One consequence of these new incentives was the decrease in hospital inpatient episodes and length of stays, and an increase in the lower cost outpatient episodes. The primary responsibility of patient care continues to reside with the physicians. This responsibility for the types and duration of care the physician's control has made them the focus for managed care. The physician groups in California have been predominantly contracted by HMOs to accept a capitated PMPM for a defined set of both institutional (hospital) and professional (physician) care.

Within most of the HMO and physician contracts reside incentives to ensure both cost effective care and quality care. The physicians typically agree to accept a rate that has been actuarially calculated based on the historical costs associated with both the areas and demographic characteristics that comprise the beneficiary population. The contracts between HMOs and providers however, include provisions for monitoring the quality of care that patients perceive.

The opportunities inherent for both the HMO and the physician group are to manage care below the historical utilization rates and maintain patient satisfaction for continued plan enrollment.

In addition to the physician's responsibility to manage the intensity and frequency of health care provisions, the HMOs endeavor to negotiate better-contracted hospital per diem rates.

The Preferred Provider Organizational (PPO) form of a managed care firm has also affected utilization and costs. The PPO attempts to negotiate the greatest savings from both institutional and professional providers for a defined population, and then shares the cost savings with contracted employer groups. Moreover, PPOs offer a variety of case management and referral policies that manages entry by beneficiaries to the type, frequency, and intensity of services. In some case management agreements, the PPO may also follow the care through all care processes to ensure appropriateness within internal and external medical guidelines.

The PPO in simple form is a contractual relationship between health care providers, institutions, employers, insurance firms, and third party administrators to provide health care services at a discounted rate.

The private sector recognized the cost effectiveness of the new HMO model and enrollment growth during the past ten years has been significant. In 1994, there were 55 million HMO enrollees (Kongsvedt, 1995). In addition, enrollment in PPOs grew from 0 in the 1970s, to 74 million by December 1991. There were many changes in the U.S. that caused the enormous growth in managed health care.

Medical practices transitioned from private to group practices, corporations became more cost conscious, health care providers become more specialized, the prevalence of indemnity insurance enticed over-utilization, and Medicare and Medicaid laws prompted significant increases in teaching and investor owned hospitals (Brown, 1993).

HMO Cost Controls

HMOs have been operating under the simple premise that they can control costs and improve the quality of care.

However, the true dimensions of cost control and quality of care are far from simple. How costs are limited is a key element for the successful outcome of care.

Common methods for controlling utilization in managed care organizations include prospective, concurrent, and retrospective reviews. In prospective reviews, admitting physicians may pre-certify the patient to ensure appropriate care, begin the scheduling tasks, prepare discharge planning systems, and capture financial and operational data. The pre-certification process provides the structure for organizing care efficiently and medically appropriately.

In some cases, utilization management may receive queues about incoming patients so that clinical and administrative protocols can be followed. Also, pre-certification verifies and ensures compliance with insurance and regulatory guidelines.

Concurrent review is the management of utilization during the course of health care. Some of the techniques employed are tracking of length of stay, UM Nurse review, and discharge planning.

The review process may include maximum lengths of stay, level of treatment (inpatient, outpatient, partial, structured), and medical appropriateness.

In addition, concurrent review allows administration to efficiently manage work loads and resource utilization.

Retrospective review occurs after the case is finished and the patient is discharged. Retrospective review includes claims examination and episode evaluation. The claims review process adjudicates mistakes, improprieties, and seeks to optimize billing.

The retrospective process reviews claims to ensure that third party liability payment sources are identified (maximizing collections), optimal billings for procedures are made (maximizing revenues), fraud is minimized, and errors are minimized. The pattern or episode review component examines utilization and compares them with industry, internal, and regional normative data to reengineer existing methods to achieve optimal outcomes. It continuously evaluates industry methods and normative data to internal patterns of care to make internal changes as necessary.

Medicaid and California's Medi-Cal

Medicaid Background

Title XIX of the Social Security Act is a Federal-State matching entitlement program that provides medical assistance for certain individuals and families with low incomes and resources.

This program, known as Medicaid, became law in 1965 as a jointly funded cooperative venture between the federal and state governments to assist States in the provision of more adequate medical care to eligible needy persons.

Medicaid is the largest program providing medical and health related services to America's poorest people. Each state establishes its eligibility standards; determine the type, amount, duration, scope of services, and payment for services; and administer its program (Dallek, 1994).

Subsequent to their enactment, both Medicare and Medicaid had been subject to numerous legislative and administrative changes that continually sought, within financial considerations, to make improvements in the provision of health care services to the elderly and poor.

Since 1965, growth in health care expenditures has consistently outpaced growth in general revenues for all levels of government, and has been the precursor to these changes (Dallek, 1994).

Health and medical care are funded through a variety of private payers and public programs. For each year from 1975 through 1990, private funds paid for 58 to 60 percent of all health care expenditures in the U.S. By 1993, the proportion paid by private funds had dropped to 56.1 percent (Dallek, 1994).

The public share of health care expenditures has steadily increased over the past five years from 40.2 percent in 1988, to 43.9 percent in 1993.

The largest shares of public health expenditures are for the Medicare and Medicaid programs, which in 1993, accounted for 30.8 percent of the total health care spending in the U.S. (By comparison, 17.8 percent of all national health care spending comes from consumers in out-of-pocket expenditures and 33.5 percent is reimbursed by private health insurance. (Dallek, 1994).

Medicare and Medicaid expenditures represented 70.2

percent of all publicly funded health care spending in the

U. S. during 1993, with Medicare responsible for 40 percent

and Medicaid responsible for 30 percent. The 1994 FY

Medicare and Medicaid program expenditures for delivery of

services and program administration were reported at $297.5

billion (U.S. Department of Commerce, 1992).

There is a minimum federal set of standards for health

care services that must be met. The federal medical

assistance percentage (FMAP) is used to determine the share

of the federal government's expenditure for each state

(Winterbottom, 1995). States determine Medicaid eligibility

based on many factors, with the most important criteria

being income and financial resources.

The minimum eligibility criteria and benefits are developed

by each state and vary moderately.

The government pays a percentage of the state's

expenditures based on the annual per capita income in the

state compared to the national average per capita income.

If a state per capita income is below the national per

capita income, the range of federal reimbursement is 55 to

83 percent. If the state per capita income is equal to the national per capita income, the federal reimbursement is 55 percent. If the state's per capita income is above the national per capita income, the reimbursement is from 50 to 55 percent. In 1981, the Omnibus Budget Reconciliation Act reduced the payment by 3 percent in 1982, 4 percent in 1983, and 4.5 percent in 1984 (Dallek, 1994).

The states could however reduce the cutbacks if they instituted cost review programs, if unemployment was equal to or greater than 150 percent of the national rate, and if state anti-fraud activities recovered 1 percent or more of the federal payments. The reason for reducing the payments was due to health care inflation rates that were of great concern to the Congress.

The Congress however, did not wish to restrict payments to a level that would deter providers from providing care to Medicaid beneficiaries (Winterbottom, 1995).

The law does not permit the Federal Government to exercise supervision or control over the practice of medicine, the manner in which medical services are provided, and the administration or operation of medical facilities.

Facilities desiring to participate in the Medicare or

Medicaid program must meet participation conditions for

certification. State agencies certify to the DHHS indicating

whether hospitals, SNFs, HHAs, independent laboratories,

portable X-ray facilities, and providers furnishing services

satisfy, and continue to satisfy, their respective

conditions of participation in the Medicare and Medicaid

programs.

The Secretary of the DHHS certifies facilities

requesting participation in both the Medicare and Medicaid

programs. States certify those facilities that request

participation in the Medicaid program only.

The state function of making certifications is intended

to be a natural adjunct to ongoing state activities (such as

the licensing of health care facilities and the setting of

standards).

A state coordinates with other state programs that

involve payment for health care, quality of care, and

distribution of health facilities.

Coordination of these activities is essential in

assuring effective and economical use of existing state

facilities and trained personnel and to prevent duplication of effort. Where a state enters into an agreement with the Government to pay the medical insurance premium on behalf of its aged welfare recipients, the agreement may provide for a designated state agency to serve as an intermediary on behalf of its welfare recipients (Kongstvedt, 1995).

Medicaid spending is expected to grow faster than the economy as a whole and faster than State and Federal revenues, just like general health care spending. According to the Congressional Budget Office (CBO), Medicaid is expected to grow between 10 and 11 percent annually during the next six years. This growth rate is more than twice the rate of economic growth and inflation.

In the 1995 fiscal year, the combined Federal and State governments spent $158 billion and are expected to spend $262 billion by fiscal year 2000 (Congressional Budget Office 1995).

Moreover, the age distributions of the Medicaid populations are expected to be concentrated in the elderly categories during the next five to ten years. The care

provided to the elderly has historically been more costly than the younger populations.

As a result of the aging composition of the Medicaid beneficiaries, coupled with the expected increases in enrollment into Medicaid, the costs are expected to rise more sharply than in the past (Congressional Budget Office 1995).

Although in 1993 the Medicaid program represented only 6 percent of Federal spending, it represented the greatest share of the State budgets--12.8 percent. California spending increased by an enormous 23 percent from 1992 to 1993 increased, while the enrollment only increased 7 percent.

The Medicaid program has grown from $ 250 million in 1965 to over $ 92 billion by 1992. When the law was implemented, it was estimated that around 2.3 million individuals would be enrolled at any certain time. However, in 1991 over 28 million people were enrolled. These escalating costs and growth rates have prompted lawmakers to formulate new ways to provide quality care while reducing the cost of Medicaid.

Cost sharing, DRGs, reimbursement incentives and disincentives, contracted coverage, and voluntary managed care enrollments have helped reduce the rate of inflation. However, these measures still fail to control growth to an acceptable level (Kongstvedt, 1995).

All of these factors, linked together with Federal spending reduction pressures, suggest that Medicaid funds may diminish even further in California. The concern is that the quality of care--access, satisfaction, outcomes--may be sensitive to these spending reductions (Congressional Budget Office 1995).

The cause of increases in Medicaid spending can be illustrated by three main factors: the utilization of services (types and frequencies); the cost changes of services; and the number and characteristics of the individuals eligible for services (age, gender, location, quantities). In addition, since States receive a portion of Medicaid spending reimbursed from the Federal government, they have recently sought to maximize those reimbursements through disproportionate care hospital (DSH) payments. During 1989 through 1992, Federal DSH payments to States

grew by 2,400 percent. The states had pursued greater DSH

payments through strategic spending and taxing and resulted

in further exacerbated of the Medicaid inflation rates. The

reaction by the Federal government was, however, to mitigate

increases by enacting legislation in 1991 and 1993

(Congressional Budget Office 1995).

The Omnibus Budget Reconciliation Act (OBRA) of 1981

mandated some of the most significant changes in the

Medicaid program since its beginnings in 1965. The 1981 OBRA

had sought to limit the rapid Medicaid cost growth by

setting new limits on eligibility for the program, reduced

the Federal share of the program costs, and increased the

state's ability to manage the program. Prior to the 1981

OBRA, state's paid hospitals on a reasonable cost basis.

However, the 1981 OBRA not only forced eligibility cutbacks

on the states, but also eliminated the federal requirement

for reimbursement of all 'reasonable' hospital costs. This

had the effect of encouraging states to adopt prospective

payment systems. Moreover, the federal matching was reduced

by 3 percent in 1982, 4 percent in 1983, and 4.5 percent in

1984.

To further encourage cost control by the states, reductions were minimized for those states with effective cost controls and higher than national average unemployment rates.

Also arising from the 1981 OBRA was increased flexibility for administering the Medicaid program by eliminating various federal restrictions and allowing waivers. As a result, states began to examine the use of HMOs and other prepayment health care delivery systems.

The economic contractions during the early 1980s, together with federal pressures to reduce the escalating Medicaid expenditures, caused the states to pursue methods for cost reductions or slowed cost growth. The method that has culminated from these efforts to explore new cost containment is the prospective payment system (PPS). Proponents of PPS contend that it contains costs by stimulating efficiency in the delivery system. Also, early studies revealed lower hospital per diem rates for skilled nursing and intermediate care without adverse effects to access and outcomes (Buchanan 1987).

The trend to enroll Medicaid beneficiaries into managed

care plans may largely be the reaction to continued

increases in Medicaid expenses.

In 1996, over 32 percent of all Medicaid beneficiaries

were enrolled in managed care (Health Care Financing

Administration, 1996). Between 1990 and 1995, enrollment

into managed care plans increased over 400 percent. Also, by

1995, 43 States had some form of Medicaid managed care

initiative.

By 1994, forty-three states and the District of

Columbia had a Medicaid managed care program either

implemented or in the demonstration phase.

The HMOs provide beneficiaries with a specific package

of benefits in exchange for a fixed, per capita, prepaid

premium. The prepayments to HMOs provide the states with

predictable and easier payments. In addition, the state's

receipt of claims for individual services could be

eliminated and could thereby reduce administrative costs.

The capitated premium per member per month (PMPM)

accommodates more predictable budgets because maximum

liability is establish in advance.

The HMOs are required to monitor the program and also accept financial risk for the enrollees. As part of the monitoring responsibilities, HMOs must evaluate and ensure the quality of care the enrollees receive. The HMOs are accountable to the states, federal government, and third party monitoring agencies such as the National Committee for Quality Assurance (NCQA).

The NCQA developed a voluntary health plan performance measurement tool called the Health Plan Employer Data and Information Set (HEDIS).

This performance measurement tool provides health plan utilization data for selected procedures, and information on enrollment, access, quality assessment and improvement, and enrollee satisfaction. In addition, other quality assurance and improvement systems for Medicaid managed care were developed under the Quality Assurance Reform Initiative (QARI) during 1991-1993.

In 1989, the Agency for Health Care Policy and Research (AHCPR) was created to enhance the quality, appropriateness, and effectiveness in health care services. AHCPR began developing Patient Outcome Research Teams (PORTS) used to

study diseases and clinical practice guidelines. These guidelines and efforts were intended to be yet another tool for measuring the quality of care.

HCFA had collaborated with states, health plans, and other organizations to develop a system intended to improve oversight of Medicaid managed-care quality. (U.S. Department of Health and Human Services, 1993). The QARI initiative consisted of voluntary guidelines for managed care health plans and states to use when contracting for Medicaid.

Both the QARI and HEDIS tools provide useful information for plan evaluation.

The common goal among these and other evaluation tools is to monitor the quality of care by using valid, efficient, effective, and standard instruments.

Federal laws mandate states to monitor the Medicaid managed care plans to ensure quality care (42 USC 1396a(a)(30)) and to conduct annual audits of contracted plans (42 CFR 434.53). The audits must be conducted by peer review organizations or independent bodies.

The experience of the early prepaid group practices, which served as HMO prototypes, revealed reduced costs

without reducing the quality of care. The organizational benefits of the prepaid group practice and the financial incentives to the physicians encouraged the reduction of medically unnecessary care. The purpose for quality of care regulations-both self determined and legally mandated--is to safeguard the beneficiaries from the potentially deleterious restriction of necessary care.

States determine the amount and duration of services offered under their Medicaid programs. They may limit the number of days of hospital care or the number of physician visits covered. However, states are prohibited from limiting the duration of coverage for medically necessary inpatient hospital services provided to Medicaid-eligible children under age six who are in disproportionate share hospitals or to infants in all hospitals.

State Medicaid Plans must allow recipients to have freedom of choice among participating providers of health care. States may provide and pay for Medicaid services through various pre-payment arrangements, such as health maintenance organizations (HMOs).

Payment for Medicaid Services

The Federal government shares in the state's expenditures for administration of the Medicaid program. Most administrative costs are matched at 50 percent. However, depending on the complexities and the need for incentives for a particular service, higher matching rates are paid for certain functions and activities.

Federal Medicaid payments to states have no set limit. The federal government provides the state payments for the mandatory services plus the optional services that the state decides to provide for eligible beneficiaries.

States must also pay additional amounts to qualified hospitals that provide inpatient services to a disproportionate number of Medicaid recipients and to other low-income persons under what is known as the Disproportionate Share Hospital (DSH) program.

The U.S. Congress, the Department of Health and Human Services, and the individual states continually seek to make improvements in the Medicaid programs' quality, effectiveness and extent of health care services. However, the Medicaid programs must function within the various

Federal and state economic, social, and political factors constraints.

The growth in Medicaid beneficiaries clearly depicts the growing needs due to recessions, slowed economic growth, and underlying social problems.

The risk is that financial pressure to reduce Medicaid funding and subsequent lowered reimbursement to providers may create poor quality care. The Medicaid reimbursement rates for risk contracting are far below the private reimbursement rates (Dallek, 1994).

If inflation continues to climb rapidly in the private sector while the public Medicaid funds continue to rise very slowly, insurers and providers could be forced to either subsidize Medicaid beneficiaries or develop a two-tier provider system. A two-tier system could be comprised of lower cost services and procedures for lower paid Medi-Cal beneficiaries; while higher cost services and procedures may be made available for higher paying plans.

The situation in California is particularly troublesome because of the slow economic growth, high influx of immigration, increased budget pressures, and already low per

capita Medicaid expenditures. In 1993, California had the greatest number of Medicaid enrollees (13.5 million) and the lowest per capita Medicaid spending ($2,090 per person).

States have options that allow innovative approaches to financing and delivering Medicaid services. Since 1981, Federal waivers have been developed to allow states to enroll Medicaid beneficiaries into HMOs and home and community systems of care.

Effective utilization management of Medicaid populations is essential. The Medicaid populations are generally sicker, while states will, in most cases, contract with providers at rates less than commercial plans. In addition, some states mandate more comprehensive educational and preventative services than commercial plans. Traditionally, disenrollment rates are very high because of the nature of Medicaid eligibility. In addition, systems for monitoring eligibility must be in place to evaluate and update changing eligibility.

HMO's may reduce the length of stay, limit high technology, institute indirect and direct barriers to care, changes service mixes, shift costs to other insured, reduce

ancillaries, and provide different qualities of care as a way to reduce costs.

If the effects are poor quality of care to the Medi-Cal beneficiaries, in the long term, savings from increased HMO enrollment may not exist. This problem poses questions for policy makers. Will the increased enrollment of Medi-Cal beneficiaries in HMOs yield improvements in care and costs? Moreover, will verification mechanisms be in place to assure quality, efficacious, and cost effective care.

Alternatively, the continued lack of policies, verification mechanisms, and regulation that exist today may yield adverse outcomes for Medi-Cal beneficiaries.

A proposed method for linking the quality of care dimensions with Medi-Cal reimbursement policies has been proposed by The Center for Health Care Rights that would, in their proposal, influence the way in which care is provided to the Medi-Cal populations enrolled in HMOs.

During the early 1980s, sweeping Medicaid reductions took place. Benefits and payments were reduced. However, during the late 1980s, Medicaid expansion took place. Between 1984 and 1990, more than a half million pregnant

women, five million children, and millions of elderly and disabled became eligible for Medicaid.

As a result, the early 1990s saw great concern for the growth of Medicaid expenditures.

The challenges of providing quality care while driving down inflation in the health care system in the country and the state have become more polarized in recent decades. Since the 1981 Omnibus Budget Reconciliation Act (OBRA), Medicaid risk contracting grew from 1 percent to over 4 percent in 1990. By 1995, HCFA reports show 3 million (14%) Medicaid enrollees in managed care plans.

According to research that measures the effects of a prepaid group practice on services and the effectiveness of care, quality of care does not diminish if Medicaid beneficiaries are enrolled in a large HMO containing private beneficiaries. However, smaller HMOs have less ability to spread the costs across a greater population and therefore attempt to compensate for the lower reimbursement rates by reducing medical care services. Data show that the average length of stay for all patients has been reduced over the past 12 years. The concern is that the Medicaid patient

average length of stay has decreased at a greater rate

(Rice, 1996).

In California, 1992 and 1993 audits of managed care

providers revealed numerous deficiencies.

The audits analyze and present findings about how well

managed care plans meet state access and quality standards.

Also, the audits measure the degree to which findings

improve care.

The audits evaluated the following areas: quality and

continuity of care, medical records, plan administration,

grievances, pharmacy services, human reproductive

sterilization, licensure, facility review, scope of

services, and infection control. The audits rated each area

from 1, no deficiency, to 5, severe deficiency (Dallek,

1994).

The findings of the managed care plans revealed serious

quality of care problems in 14 of 15 medical audits.

Moreover, the quality of care findings had no impact on

subsequent years. Of the 4 PHP managed care plans audited,

all had "significant" or "major deficiency" citations. Two

of the four had significant deficiencies in access. Three of

the four had significant deficiencies in continuity of care. Two of the four were cited for significant basic pharmacy. There was one PHP plan that had worsened significantly after the audit instead of improving.

The citations were for significant irregularities and not minor infractions (Dallek, 1994).

In addition to the aforementioned citations, the managed care plans experienced high turnover rates. All plans except Kaiser experienced double-digit disenrollment rates for the years in which they were audited. Two of the plans experienced turnover rates in excess of 100%. Disenrollement may result from one or many reasons.

The first subject of interest is the marketing methods employed by the managed care organizations (Dallek, 1994). California has allowed door-to-door and welfare office solicitations of the managed care plans. Also, commission incentives have been provided for sales agents to enroll as many as possible.

According to a 1993 General Accounting Office (GAO) review, "Marketing can be used to educate beneficiaries

about health plans, but it can also be used to coerce

beneficiaries and gain their enrollment."

There have been numerous complaints during the past

several years concerning these marketing practices.

In fact, the Medi-Cal beneficiaries may have heightened

expectation about the new benefit plan, only to be inflated

by the unfamiliarity of managed care (Dallek, 1994).

The DHS maintains records of the reasons given for

disenrollment. According to the 1993 data for disenrollment

reasons, the top five reasons in order were: general

dissatisfaction, preference of FFS, no reason,

transportation, and prior care.

The problem in California is the accelerated desire to

enroll half of the Medi-Cal beneficiaries in an HMO by the

end of 1996. The audits, literature, and evidence suggest

that policies, procedures, clear guidelines, and

infrastructure do not exist to ensure the level of care that

would meet the federal and state statutes. The audits

examined many recent years up to 1993 without depicting

significant improvements (Dallek, 1994).

In 1992, the federal Health Care Financing

Administration (HCFA) reviewed California's administration

of its managed care program and concluded:

> "The administrative demands of keeping such a
> large, highly visible program in place while
> being subjected to unprecedented growth have
> not unexpectedly eroded the efficacy of day
> to day contractor oversight, technical
> assistance, and communication, ultimately
> impacting the program's Medi-Cal Customers.
> As a result, it appears that the quality of a
> contractor's performance depended more on its
> own internal integrity and competency than on
> the guidance and supervision of the state.
> There was also an unevenness in the degree of
> state supervision and quality of
> communications with the plans, dependent on
> the level of experience, expertise, and
> active involvement of the different state
> contract managers." (HCFA, 1993)

HCFA further suggests that the state of California

limit and prioritize the expansion of managed care. However,

the state has ignored the suggestion and has begun massive

managed care expansion.

The increased debate about enrolling Medicaid and

Medicare beneficiaries into Health Maintenance Organizations

has raised concern about methods for monitoring the quality

of care those beneficiaries can expect.

The demand for reducing the budget deficits at the federal and state levels has forced policy makers to explore ways to reduce government expenditures.

Since Medicaid and Medicare represent a large portion of government expenditures and have experienced inflation rates greater than the general inflation rate, the governments have targeted them for cost savings.

To ensure that Medicaid and Medicare populations are provided quality care while reducing costs, agencies are evaluating methods for monitoring the outcomes and quality of care. Two measures currently used are preventable readmission and mortality rates. Preventable readmission to a hospital shortly following a previous discharge may be viewed as an adverse outcome of care because of the added direct financial costs to the payer, costs attributable to the patient's added suffering, and the costs of missed opportunities.

If the quality of the care is insufficient to ensure that the patient has stabilized to a state that would significantly increase the chances of healing, the patient may become more ill or secondary adverse harm could occur as

a result, and thus the patient may require readmission to the hospital. Moreover, the financial pressures to reduce lengths of stay may unwittingly or intentionally cause patients to be discharged more quickly than required for appropriate observations and healing.

The advent of a readmission to hospital care is considered undesirable because it potentially allocates scarce resources that would have otherwise been expended on other care. In other words, it is inefficient and may have resulted in missed opportunities. Also, readmissions may be the outcome of deficient operations and structural segments of a hospital. Prior research has also suggested greater costs in patient suffering and ancillary damage to a patient's health as a result of the linkages to early discharge and the subsequent readmission. As a result, preventable readmissions can be used to monitor the quality of care (Jones 1986).

In addition, mortality rates can serve to measure the performance across different hospitals and payer plans. Death is considered an adverse outcome because it is the result which health care institutions wish to mitigate the

most. Deaths are also most clearly discernible and carry the least interpretive bias. When properly controlled, mortality rates can be proximate outcome measures for identifying and targeting institutions or payer plans that, for some reason, may have underlying deficiencies as their causes.

Table 1 depicts California and national health care utilization data, HMO membership information, and government expenditure data from 1991. The California cost per patient day was 31% greater than the U.S., average. The average hospital cost per stay in California was 12% higher than the national average. The California average length of stay (ALOS) was one day less than the national average (5.6 versus 6.6, respectively).

California expended 10% less per capita for hospital care and 27% more per capita for physician care. This may reflect the lower hospitalization rates and higher outpatient rates.

California also had fewer hospital beds per 1,000 persons (2.5) compared with the national number (3.5). Moreover, California had 8% more physicians per 1,000

persons and 29% fewer admissions per 1,000 in 1991 (U.S.

Department of Commerce, 1992).

The HMO data show 107% greater enrollment per 1,000

into California HMOs (317.7) than the national rate (153.7).

Also, the 9.8 million enrollees represent 25% of the overall

national HMO enrollment, while California represented 12% of

the national population in 1991 (Winterbottom, 1995).

Table 1 U.S. and California Utilization Comparisons

Description(1991)	U.S.	California	Diff. CA - U.S.	% Diff.
COSTS				
Hospital Cost per Patient Day	$914	$1,199	$285	31.2%
Hospital Cost per Stay	$5,786	$6,470	$684	11.8%
Expenditure per Capita for Hospital Care	$1,134	$1,025	-$109	-9.6%
Expenditure per Capita for Physician Services	$598	$761	$163	27.3%
Hospital Beds per 1,000 population	3.5	2.5	-1.0	-28.6%
Admissions per 1,000	125.3	102.5	-22.8	-18.2%
Inpatient Days per Admission	6.6	5.6	-1.0	-15.2%
Physicians per 1,000	247.2	267.5	20.3	8.2%
HMO MEMBERSHIP:				
HMOs	556.0	46.0		
HMO Members <1,000>	38,768	9,769		
Members per 1,000	153.7	317.7	164.0	106.7%
GENERAL REVENUES:				
Revenue per Capita	$3,578	$2,966	-$612	-17.1%
STATE & LOCAL TAX & REVENUE SOURCES				
$ per Capita	$2,083	$2,283	$200	9.6%
% from Individual Income Taxes	20.8%	24.3%	3.5%	16.8%
% from Corporate & Other Taxes	11.9%	12.9%	1.0%	8.4%
GENERAL EXPENDITURES				
$ per Capita	$3,590	$3,978	$388	10.8%
Expenditure % Education	34.2%	31.9%	-2.3%	-6.7%
Expenditure % Welfare	14.0%	14.4%	0.4%	2.9%
Expenditure % Health/Hospitals	9.0%	9.1%	0.1%	1.1%
Expenditure % Police/Corrections	8.2%	10.3%	2.1%	25.6%
Expenditure % Highways	7.2%	4.6%	-2.6%	-36.1%
Expenditure % Other	27.4%	29.7%	2.3%	8.4%

Table 2 shows selected U.S., and California health care spending and utilization (Winterbottom, 1995).

Table 2 Select U.S. and California Expenditure Data

Description	U.S.		California
HEALTH CARE SPENDING IN BILLIONS (1990):			
Government	352.9	53.0%	
Public	282.6	42.4%	
Other	30.6	4.5%	
Hospital Care	286.1	38.4%	31.1
Physician Expenditures	150.9		23.1
		$ Each	
Medicaid Enrollment 1990 <thousands>	25,255		3,624
Medicaid Payments 1990 <billions>	$66.0	$2.5	$6.5
Medicaid 1990 Total Hospital Discharges <1,000>	3,932		
Medicaid 1990 Recipients Discharged <1,000>	2,758		
Total Days of Care	22,059		
Medicaid Admissions per 1,000 covered	155.69		
Average Length of Stay (ALOS)	5.6		
All Hospitals 1990 Admissions per 1,000	131.0		
All Hospitals 1990 Average Length of Stay	7.2		
All Hospitals 1990 Outpatient Visits per 1,000	1,265.0		

Table 3 Selected Discharge Data

1991	
Total Discharges per 1,000	113.6
Discharges per 1,000 Males	101.3
Discharges per 1,000 Females	126.5
Discharges per 1,000 under 15 years of age	45.3
Discharges per 1,000 15-44	99.3
Discharges per 1,000 45-64	132.2
Discharges per 1,000 65 & over	340.3
ALOS Total	6.3
ALOS Males	6.9
ALOS Females	5.8
ALOS Under 15 years of age	4.8
ALOS 15-44	4.7
ALOS 45-64	6.5
ALOS 65 & over	8.6

Tables 3 and 4 show mortality rates by age categories

and gender in 1991 for the U.S. Figures 17 and 18 show

California census data by demographic characteristics.

Table 4 Mortality Data

Age	Deaths per 100,000
Under 1	916.6
1-4	47.4
5-14	23.6
15-24	100.1
25-34	139.1
35-44	224.4
45-54	468.8
55-64	1,181.0
65-74	2,618.5
75-84	5,890.0
85 & Ove	15,107.6

Research Approach

In this research, preventable readmissions and deaths

were used as indicators for measuring the quality of care.

Specifically, the variations in rates between Medi-Cal and

HMO cases from the OSHPD California Hospital Discharge

Dataset were compared to test the hypothesis that Medi-Cal

beneficiaries did not experience higher risks of

readmissions and deaths when enrolled in HMOs.

A large data set had been abstracted from the

California Office of Statewide Health Planning and

Development Hospital Discharge Data to measure the

preventable readmission rates among California hospitalized

patients in 1991. Similar to mortality, preventable

readmission to a hospital shortly following discharge is a

discernible event with a connection to the quality of care.

Prospective payment systems, based on diagnosis related

groups or risk capitated payments, theoretically provide

incentives for the early discharge of beneficiaries. Early

discharges may increase the risk of ensuing preventable

readmission if all necessary medical care is not completed

appropriately during a patient's first hospital stay.

Although Clear linkages between preventable

readmissions and poor quality of care during the ensuing

hospital stay have been established, continued research to

measure preventable readmissions should continue.

Moreover, the current political resolve to achieve

Medicaid cost savings from greater HMO enrollment will

likely raise the specter and scrutiny of partisan

politicians, employers, beneficiaries, and managed care

opponents.

This research explores the results of Medi-Cal non-HMO

beneficiaries and HMO beneficiaries. The Medi-Cal

beneficiaries enrolled in HMOs may also be included in the

HMO; which, is acceptable because the effects of plan

selection and respective risks (HMO or Medi-Cal FFS) are the

ultimate goals of this research.

Hypothesis

I hypothesize that preventable readmissions and

mortality rates of the 1991 hospitalized Medicaid cases were

not higher than the Health Maintenance Organizations (HMO)

beneficiary cases.

CHAPTER TWO - REVIEW OF THE LITERATURE

Quality of Care

Defining quality of care has become a major concern of

employers, consumers, payers, and health care professionals.

There are varying degrees of quality, numerous methods to

measure quality, and many influences on quality. According

to Avedis Donabedian, in simple terms, quality care is the

balance between health benefits and harm (Donabedian 1982).

Furthermore, Donabedian contends that assessment of quality

is a judgment concerning the processes of care, based on the

extent or degree to which the care contributes to valued

outcomes. The attributes that comprise quality are not

clear. Judgments are often made about the persons providing

care and the settings where the care was provided. The

management of an episode of care is perhaps the most common

and easiest module of care that is studied.

An episode of care identifies many elements that can be

used to assess the quality of care (Donabedian, 1982).

A primary tenet of Donabedian's definition was that

management of patient care can be divided into two domains:

technical and interpersonal. The technical domain is

comprised of the science of care methods and technology. The

interpersonal domain pertains to the social and

psychological interactions between the patient and provider.

The two domains are closely related and may influence one

another. Amenities such as room comforts, good food,

pleasant surroundings, and similar comforts can be

considered as part of the interpersonal domain. They are

considered to belong in the interpersonal domain because

they are perceived to be linked with the provider of care.

The quantity of care must also be considered when making a judgment about quality. If amounts of care are insufficient to realize an intended benefit, then the quality of care is poor. Conversely, excessive unnecessary quantities of care could be considered poor quality as well. If unnecessary care is given, missed opportunities to use resources that could have benefited others in need may occur.

The failure of a system to provide an appropriate quantity of care may suggest inadequacies in the system for providing care, poor judgment, carelessness, or ignorance.

The monetary costs of care also perform an important part in the quality of care. There is a direct relationship between quantity of care and monetary costs. Donabedian contends that care is costlier if excessive or inefficient. The inefficient care may be a result of unbalanced staffing, inappropriate work duties, and unbalanced occupancy rates.

The monetary costs used to determine the quality of care may be used if the costs are added to risk as an unwanted outcome of the care provided.

There are many specific elements in providing the care which influence benefits and risks: patient condition, co-morbidities, medical technology, staff competency, contractual restrictions, intensity of workload, and many more. The ultimate goal of providing quality care is to achieve the peak benefits after the deduction of risks and costs.

Also, it is important to mention that providers may vary about their perceived benefits, risks, and costs (Donabedian, 1991).

In the managed care environment of today, costs may be a factor that has become too influential. As revenues decrease, the costs have become a covariant and must also decrease.

The application of judgments and measures of quality must correspond to the purview of the care given and relevancy. Thus, it may be necessary to evaluate the structure, process, and outcome for a defined beneficiary, group, or population.

Assessment Approaches

Donabedian developed an approach for quality assessment and program evaluation with three fundamental relations: structure, process, and outcome.

The structure component is characterized as the provider stability, tools and resources, physical organization and settings, and health insurance. The process element is the set of activities within and between patients and providers.

The outcome's portion of the model is the change in a patient's health status that is attributed to the health care provided.

The idea of structure includes financial resources, human resources, and physical settings. It includes the quality and quantity of the personnel, equipment available, health care facility geographic distribution and quantities, finance and delivery of service organization, and the presence of health insurance. Structure is related to quality in that it may increase or decrease the probability of good performance. A good structure for care should include a mechanism for monitoring the quality of care.

The process element of the model assesses the
relationship between the characteristics of the medical care
processes and their consequences to the health and welfare
of individuals and society, in congruence with the values of
the individual and society.

Also, the technical characteristics of the process of
care and the resulting consequences may be revealed by
examining congruence with norms of care, appropriateness,
and technological advancement.

The process of care is therefore normative behavior.
The norms are derived from science, society, and ethics. The
assessment of processes of care may be observational or by
review of records.

Finally, the outcome component of the model attempts to
measure the change in health status as a result of medical
care. It includes patient knowledge, attitude, and
behaviors. The assertion includes social, psychological, and
social function aspects of performance. Also, patient
satisfaction is included as a component of outcome. Outcome
measurements provide indirect proxies of health objective
attainment. Donabedian contends that outcomes are clearly

the best method of evaluating the quality of care provided. To serve as the measure of quality, other causes for changes in health status must be eliminated.

Thus, structure, process, and outcomes are approaches to the acquisition of information about the identification of attributes that define and effect quality care. In this research, I have chosen outcomes as the approach to assessing the quality of care.

The theoretical framework for evaluating quality, outcomes, and monitoring was based on Donabedian's models. The methods and findings from Donabedian's research lend a paradigm for evaluating outcomes as a measure of quality health care.

Although little empirical evidence exists to show that the quality of care is significantly diminishing as a result of increased managed care enrollment, it is important that quality must not be weakened or diminished. There are several organizations with indirect authority that are chartered to monitor the quality of care. Two of these organizations are JCAHO and NCQA.

Moreover, states like California which license HMOs conduct random audits to ensure compliance with strict rules and regulations.

At this time, no clear and effective method of measuring the quality of care exists; instead, proxy or quasi methods of evaluating outcomes are used. These measures include patient satisfaction surveys, targeted prevention methods--breast cancer screenings per 1,000, immunization compliance, recidivism, lengths of stay, admits per 1,000, days per 1,000, cost per procedures, employee absenteeism, employee turnover, substance abuse rates, mortality rates, low birth weights, and many more. Moreover, explicit clinical guidelines are under development in the private and government segments that will be used to evaluate modalities, treatment efficacy, and refined care pathways.

The shift from input to outcome's management provides health care professionals, payers, society, employers, and patients with the tools and measures to allocate scarce resources where the greatest benefit will be realized. The

outcome measurements provide patient and system level data that can be measured and applied.

It would be imprudent to attempt structural and process level assessments as the primary objective due to the enormously complex systems that exist.

Preventable Readmission Literature

Discharge Education and Readmissions

The case management process addresses the issues of resource allocation, effectiveness of care, cost containment, and accountability--all important elements in an effective utilization program.

It is important that case management of the patient, including discharge planning and discharge education, begin at admission, to prepare the patient for self-care at home, for every patient in the hospital faces discharge. Recovery from illness may be improved, the transition to home can be eased, utilization of home health care may be decreased, and unplanned preventable readmission may be decreased when the nurse provides supportive-educative guidance and teaches the patient self-care while in the hospital (Harmon, 1993).

Patients who have been instructed prior to discharge in the care that is to be continued at home, including medications to be taken, had fewer preventable readmissions. When the patient receives no education or inadequate education in the hospital, preventable readmission to the hospital may occur, resulting in unnecessary utilization of limited resources (Harmon, 1993).

A descriptive study of preventable readmissions relating to education as a part of the discharge plan was conducted in a large urban acute facility. The medical record was used to answer the question of whether or not a need for discharge education was identified, and if a need was identified, was discharge education provided.

If discharge education was or was not provided, did an unplanned preventable readmission occur for that reason.

The theoretical framework for this study of the relationship between patient discharge education and unplanned hospital preventable readmission was based on Orem's Self-Care Model. According to this research, appropriate discharge education, which teaches the patient self-reliance and self-management, could decrease health

care costs associated with unplanned preventable readmission.

A person's knowledge of activities that need to be performed to maintain health and recover from health deviations and the knowledge of the skills needed to perform the actions that knowledge provides are essential to preventing unplanned hospital preventable readmission (Harmon, 1993).

A supportive nursing system provided the framework for goal oriented action to meet universal self-care requisites during discharge planning of ambulatory patients. The care plan progressed from wholly compensatory to educative developmental care directed toward family education. Nurses have professional and legal responsibilities in performing nursing care and preparing the patient for self-care.

Case management and discharge planning are the processes whereby the patient's needs are identified for care after hospitalization and coordination of needed education.

Discharge planning provides for continuity to the home setting of the care that was provided in the hospital

(Harmon, 1993). The discharge planning function focuses on the restoration of the patient and must involve the participation of the patient, family, and friends to be successful.

The process incorporates the assessment of the patient's needs, the plan of actions to prepare the patient for discharge, the discharge implementation plan, and the evaluation of the plan outcomes.

The Joint Commission on Accreditation of Health Organizations (JCAHO) Accreditation Manual for Hospitals (1989), which monitors the quality of care provided to patients by hospitals, requires in the Medical Record Services Standard that medical records are documented in an accurate and timely manner, including any specific instructions given to the patient and/or family. The JCAHO Standard also requires that advisement is given relating to physical activity, medication, diet, follow-up care, and that the medical record indicates when preprinted instructions are given to the patient.

The JCAHO Nursing Services Standard requires that patient education and nursing documentation is relative and

concise, and those patients who are discharged from the

hospital requiring nursing care also receive instructions

and counseling prior to discharge (Harmon, 1993).

Identified Education Need for Self-Care

Education need was defined as any need for discharge

education, teaching, or instruction in self-care identified

by a professional, the patient, or the researcher.

Twenty-one (95%) of the readmitted group were

identified as needing education by the following

professionals: nurse, physician, rehabilitation therapist,

medical social worker, dietitian, and dentist. Considered

were the pharmacist, speech pathologist, and the protocol

R.N.; however, these professional did not identify a need

for teaching self-care. In addition, the patient identified

an education need and the researcher identified discharge

education needs for self-care that were not otherwise

identified (Harmon, 1993).

For the 21 readmitted subjects, 95% (n=21) had 45

education's needs identified in nine categories: (1)

physical activity; (2) activities of daily living and/or

instrumental activities of daily living ; (3) diet; (4)

medication; (5) procedures; (6) community resources; (7) emotional support, (8) symptom control; and (9) durable medical equipment and/or oxygen. Thirteen (65%) of the not readmitted group were identified as needing education by the professionals and had 24 identified education needs in sever of the nine categories. No education needs were identified for community resources or emotional support in the non-readmitted group. Four subjects (20%) in the not readmitted group had no identified need for self-care education and 3 (15%) were not applicable (expired).

There was no significant statistical difference between the two groups in the education need identified ($x2=13.9$, $df=8$, $p=0.08$). When education need was scored by category for the two groups with each need receiving a score of one, no significant statistical difference was observed ($x2=9.9$, $df=6$, $p=0.1$; $t=2.5$, $df=40$, $p=0.1$).

An education need was identified by nursing staff in 24.5% of the readmitted group, which included Staff RNs Staff LVNs, Discharge Planners, and a student nurse.

In the non-readmitted group, education was identified by nursing staff for 35% of the subjects.

Education Provided for Self-Care

Twenty (95.2%) subjects in the readmitted group were identified as the person to be taught, and/or nine (42.9%) significant others. In the not readmitted group, 11 (64.7%) of the patients were to be taught and/or six (35.3%) significant others.

Readiness of the patient to learn was determinable in all cases. Typical descriptors given for readiness to learn were: motivated, willing, understanding, cooperative, or receptive. For not ready to learn, descriptors were anxiety, unwilling, cognition deficit, mentally not ready to accept disease status, and unstable emotional status. Some subjects had more than one descriptor.

Indicators considered but not present were: eager, pain, hesitant, language, depressed, functional disability, and low comprehension (Harmon, 1993).

There were 22 cancer patients readmitted to the hospital in the study. All of the subjects were readmitted to the hospital within 15 days of discharge from an acute care facility.

Ages ranged from 14 to 70 years, with a median age of 57.5 (Mean 53.6, SD 19.05). Of the nine males (41%) and 13 females (59%), 50% (n 11) were single, widowed, or divorced.

English was the language of 82% (n 18). 4% (n 1) spoke Spanish; language was not available for 14%.

The control group consisted of a convenience sample of 20 subjects randomly matched with the readmitted subjects on the date of discharge from the initial admission. The control group was not readmitted within 15 days. Ages ranged 24 to 80 years, with a median age of 53.5.

Seven males (35%) and 13 females (65%) were in the control group, of whom 60% were married, and 40% were single, widowed, or divorced. 90% of the control group were English speaking, 5% were Spanish speaking, and for 5%, language was not available. Educational level was not available for the control group.

There was no significant statistical difference between the readmitted and the not readmitted groups in age, gender, martial status, or language (Harmon, 1993).

Many occupations were represented, ranging from clerk to executive. No analysis of difference in occupations was

performed. Educational level was not easily retrievable,
therefore it was not analyzed.

Hospital Preventable Readmission

To determine the relationship of caregiver's knowledge
of home care to preventable readmission of high-risk infants
and toddlers, Kun and Warburton (1987) conducted telephone
interviews 48 hours after discharge from the hospital using
questionnaires based on the actual practice of home care
nurse specialists who had assisted physicians in
establishing guidelines for each specific treatment.

Questions were categorized into three areas: (1) basic
knowledge of treatment; (2) knowledge of operation and
maintenance of equipment and supplies; and (3) information
about vendors.

Sixty high-risk infants and toddlers at Children's
Hospital of Los Angeles were discharged with written home-
treatment instructions from the intermediate care infant and
toddler units between October 1, 1985, and February 28,
1986.

The intermediate care unit had nurse-to-patient ratio
of 1:3. Subsequent preventable readmissions were monitored

and studied for six months following the initial discharge. Non-parametric statistics were used to describe telephone assessment of knowledge base and hospital preventable readmission data.

Parents of patients with single treatments scored higher in their knowledge base than parents of patients with multiple home care treatments; caregivers of patients readmitted scored well. This study concludes that none of the preventable readmissions were due to a failure of home care management for patients with single treatments without showing causal link. It does not give the method of measuring preventable readmissions nor does it address the cost of preventable readmission. Missing also is information on patient education during the hospitalization.

Elderly patients who received medication instructions from the nurse as a part of the discharge planning process was less likely to be readmitted to the hospital (Markley and Igou, 1987). This study indicates that the educational process should be an integral and expected part of the patient's daily activities over the period of hospitalization.

A study of 2,238 medical records randomly selected from 42,880 discharges in six contrasting hospital populations found that 13% of the patients accounted for as much of the hospital charges as the other 87%, and that cancer was included in six of 19 major diagnostic categories representing two-thirds of the most costly 20% of patients (Zook, Savickis, and Moore 1980).

Among these high cost patients were those with repeated hospitalizations within one year for the same disease.

Another study found that repeated hospitalizations for the same disease accounted for 60 percent of all hospitalizations were more expensive than the first hospitalization, with cancer one of the three exceptions with no statistical difference.

Patients with particular illnesses or traits that lead to repeated hospitalization could benefit from vigorous follow-up to increase medical compliance. In addition, health insurance financial incentives should be structured to encouraged preventive programs and low-cost alternatives and to discourage costly hospital preventable readmissions.

Ten variables were identified through regression analysis that were statistically significant predictors of preventable readmissions within 60 days of discharge for the Medicare population (Anderson and Steinberg, 1985). Patient education was not addressed in the 20 variables studied.

Patients with a discharge diagnosis of cancer, as well as those with AIDS and renal disease, were associated with increased risks of emergency preventable readmission within 90 days of discharge (Phillips, Safran, Cleary, and Delbanco 1987).

Twelve diagnostic categories associated with preventable readmission and suspected laboratory or demographic variables were tested.

Patient education as a variable was not tested. Decision analysis was used as a framework to examine the interrelation of cost and efficacy for interventions designed to reduce emergency preventable readmission to an acute care hospital (Safran and Phillips, 1989). Patient education as a specific cost and benefit were not examined, but rather was included in a list of services that hospitalized patients receive.

Forty medical records were examined using non-disease-specific discharge criteria for adequacy of medical care for patients readmitted within 90 days (Ashton, et al., 1987). A significant degree of predictive validity was found.

The Rand Corporation, however, with the Department of HHS, did compare outcomes of the prepaid care to fee-for-service, including a small Medicaid enrollment, in a 1986 study of participants in the Group Health Cooperative (GHC) of Puget Sound, Seattle. The study concludes that for most people, and particularly for those with high incomes, GHC care saved money and may have been better for health outcomes.

For the limited group of Medicaid enrollees that the study covered, health outcomes appeared poorer than for those in fee-for-service.

GHC officials acknowledged that the system would need modification and supplementation for the poor (Ware, 1987).

The most comprehensive comparative study that considered outcomes for Medicaid/AFDC HMOs has been conducted by the Research Triangle Institute for the Health Care Financing Administration (1988). In this research

project, a quality of care study was completed in 1985 for

populations in mandatory Medicaid HMO demonstration projects

in Santa Barbara County, CA and Jackson County, MO. These

were compared to fee-for-service Medicaid populations in

adjacent communities. The project took a random sample of

2,400 women on AFDC between 15 and 45 and their children

under 4 years old. Over 2300 births were abstracted from the

four projects, as well as other selected information such as

maternal health status and outpatient services. Medical

records were abstracted for this sample, and questionnaires

given to doctors and clients.

The overall conclusion of the study was that the HMO

management of care showed no significant effect on self-

assessed health status, health habits, or use of preventive

services.

In particular, no significant effect was found in mean

birth weight or the low birth weight rate, in the C-section

rate, or in the complications of delivery.

The study found, however, that care in all the sites

was "inadequate" and that these problems were "generic to

the population served and to Medicaid programs regardless of

the existence of capitation or case management" (Executive

Summary, Research Triangle, p. 3, 1988).

According to a 1991 study at the Harvard School of

Public Health, 150,000 persons die each year in hospitals

due to negligent care; this figure is six times greater than

from street crime. Moreover, a study conducted at Rand by

Dr. Robert Brook, concluded that one-third of all

hospitalization care is inappropriate. These data clearly

depict the costs associated with inappropriate health care.

CHAPTER THREE -- METHODOLOGY

Design and Methods

To determine whether Medi-Cal and HMO readmissions

within 30 days of discharge and deaths were potentially

preventable, I retrospectively studied hospital readmissions

and mortality rates of 50% of all California

hospitalizations in 1991 (169,397 cases). The 50% sample of

all hospital discharges was coded into three primary payer

categories: Medi-Cal, HMO, and others. The payer categories

were then compared with one another and the aggregate to

determine the odds ratio of their respective rates.

The design method employed was an observational retrospective cohort study. I controlled for confounding by matching payer categories. I abstracted data sets from the California Office of Statewide Health Planning and Development Hospital Discharge Data using random probability sampling for the patient samples. The sample size was 50% of the 1991 hospitalized patients greater than 1 year in age.

The dependent variables in this study were patient preventable readmission (nominal) and mortality (nominal). The independent variable was the patient payer type (nominal). Cases were dichotomized between death and non-death and preventable readmission or non-preventable readmission.

Reliability and Validity

The validity of using outcome measures to assess the quality of health care is quite justifiable. First, outcomes present precise and measurable depictions of the end result of care. Second, the inferences drawn from the data are justifiable. The outcome's data are less receptive to misinterpretation as a result of insufficient data.

Overall, outcomes are inherently valid because they are unquestionable about whether they are favorable or unfavorable. In other words, one would prefer life to death, functional ability to inability, and comfort from pain. The use of processes to assess quality of care requires greater validity because of the enormous variability in appropriateness of methods and technologies.

It is however important to note that not all outcomes are clearly defined as favorable or desired.

An example may be cholesterol levels, blood sugar levels, and other clinical outcome measures that are not absolutely defined. For this reason, the readmission and mortality measures were selected because of their discrete measurement.

More importantly, for the purpose of practical research, it is extremely difficult to account for all of the possible processes that take place during the provision of care. Moreover, the cost of this approach would be prohibitive.

By using outcomes as the tool for measuring the quality of care, scientific methods, technology, and processes of

care can change while the desired outcome measures remain the same.

In other words, if the desired outcome is to reduce episodes of cesarean sections from 6.3 per thousand in 1991, to 4.0 in 1999, the means of achieving the results are not measured. I do not wish to suggest that the means or methods are unimportant.

Most importantly, valid causality is derived neither from process nor outcomes. In this respect, both segments are integrated. When both process and outcomes are used to establish causality, inferences can be made with confidence.

It is more practical and cost effective to measure baseline outcomes with actual outcomes and then pursue an in-depth review of the process antecedents of care. If an outcome measure varies significantly from values that are considered appropriate or normative, then a researcher or organization may evaluate the associated processes in detail.

The use of process evaluation as a quality measurement tool is more rigid, absolute, and costly because of the breadth of required elements that would require measurement.

It is my contention that by developing standards of outcome measures at the highest point achievable, the processes and systems are encouraged and stimulated into pursuing the most efficient and innovative method for achieving the desired end results.

The use of payer source as the independent variable to measure the outcomes of death and readmission was integral to this research.

The sample size of the random sample of cases should allow for valid generalizations about the differences in outcomes between Medi-Cal and HMO payer health plan types. The similarity between the demographic composition, the primary diagnoses, and population size lends confidence in the statistical measures and conclusions from this research. In addition, the duration in years in which California hospitals have been providing these data and the State's rigorousness for verification and validation further lends to the credibility of the sample cases and respective outcomes of this research.

Internal validity was not subject to selection bias, placebo effect, or instrument selection biases associated

with other research methods. The use of an observational

retrospective cohort study allows unbiased selection of

outcomes.

The selection of the research cases was random,

relevant to the study and situation, were validated by a

reliable government agency, controlled for confounding, not

subject to researcher bias, were not subject to investigator

interactions, and were large enough to generalize about the

populations.

First Hypothesis

One Dependent Variable
READMISSION
(Nominal)

One Independent Variable
PAYER--HMO & MEDI-CAL
(Nominal)

Null Hypothesis
There is not a Statistically Significant Greater Ratio
in Readmissions of Medi-Cal Payer Hospitalizations Than
Health Maintenance Organization Payer Hospitalizations

Alternate Hypothesis
There is a Statistically Significant Greater Ratio
in Readmissions of Medi-Cal Payer Hospitalizations Than
Health Maintenance Organization Payer Hospitalizations

Point Estimate: Means Testing
Readmissions:
Medi-Cal - HMO
Student's t test

Second Hypothesis

```
┌─────────────────────────────────────────────────────┐
│              One Dependent Variable                  │
│                   MORTALITY                          │
│                   (Nominal)                          │
└─────────────────────────────────────────────────────┘
                          │
┌─────────────────────────────────────────────────────┐
│             One Independent Variable                 │
│            PAYER--HMO & MEDI-CAL                     │
│                   (Nominal)                          │
└─────────────────────────────────────────────────────┘
                          │
┌─────────────────────────────────────────────────────┐
│                 Null Hypothesis                      │
│   There is not a Statistically Significant Greater Ratio │
│     of Deaths in Medi-Cal Payer Hospitalizations Than │
│  in Health Maintenance Organization Payer Hospitalizations │
└─────────────────────────────────────────────────────┘
                          │
┌─────────────────────────────────────────────────────┐
│               Alternate Hypothesis                   │
│    There is a Statistically Significant Greater Ratio │
│     of Deaths in Medi-Cal Payer Hospitalizations Than │
│  in Health Maintenance Organization Payer Hospitalizations │
└─────────────────────────────────────────────────────┘
                          │
          ┌───────────────────────────────────┐
          │   Point Estimate: Means Testing   │
          │              Deaths:              │
          │           Medi-Cal - HMO          │
          │             Odds Ratios           │
          └───────────────────────────────────┘
```

Other variables included were gender (nominal), race
(nominal), age category (ordinal), disposition (nominal),
DRG (nominal), number of diagnoses (ratio), length of stay
(ration), and number of admissions (ratio).

CHAPTER FOUR -- RESULTS

Data Analysis

Data were analyzed using the SPSSS PC statistical

software program for statistical analysis. Descriptive

statistics were used to compare the two groups of patients:

those patients readmitted and those patients not readmitted,

and those patients who died and patients who survived.

Frequencies, means, and odds ratio analyses were used to

describe the data. Odds Ratio analysis was used to compare

nominal level data for the two groups.

There were 40 variables and 169,367 cases in the data

set analyzed. The age variable contains the patient age in

years. The payment source variable contains the expected

source of payment at the time of discharge and included the

two independent variables of Medi-Cal and HMO. The principal

diagnosis variable contained the codes assigned to the case

upon discharge. Also included was the second through fourth

diagnoses assigned to the case; however, I chose to analyze

only the primary diagnosis.

The race variable contained seven data categories and was evaluated for correlation and confounding.

In the Appendix, the data variables are shown with their scales and brief descriptions.

Sex was another variable contained in the data set that was analyzed for its effects on preventable readmission and mortality. The record number was also crucial for this research. It contained the encrypted proxy of the members social security number. This variable allowed measurement of individuals as they were discharged from hospitals throughout California.

The admission source included nine types of patient admission. This variable was analyzed to determine whether relationships existed between payer, preventable readmissions, and mortality. This variable essentially depicts the place (ER, SNF, etc.) from which the patient entered into care. There was also a variable that shows the type or way in which the patient entered care (urgent, scheduled, emergent, etc.); it is the Admission Type variable.

The length of stay (LOS) variable was used throughout the analysis. It contains the number of in-hospital days the patient experienced. The admit date code was important for determining whether a patient had been readmitted (dependent variable).

The disposition variable was important because it contained the mortality dependent variable among other possible discharge categories.

The admission major diagnostic category (MDC), and report source variables were not used in this research. The diagnosis, procedure, and admission variables were analyzed for relationships and severity of illness. The medical/surgical variable represents the service provided to the patient. The medical/surgical variable was compared with the payer types (independent variable) and the preventable readmission and mortality variables (dependents).

The multiple admissions variable is a derived variable from the patient number and admission dates. It is dichotomized to 0 meaning no preventable readmissions, and 1 for preventable readmissions present for this beneficiary.

The admits in month variable is also calculated to depict the number of admissions in the month the patient experienced.

The age category's variable is calculated to classify the beneficiary into a defined age range for more useful analyses. The mortality and payer variables were also dichotomized for the purpose of analyses. The mortality variable had an assigned value of 0 for non-death outcomes and 1 for death.

The payer variable assigned 0 for Medi-Cal and 1 for HMO beneficiary types. The data variable formats and descriptions are detailed in the Appendix.

Descriptive Results

There were 36,964 preventable readmissions (22% of study cases), from 15,736 patients during the study period. Of the 36,964 preventable readmissions, 15,733 (43%) were Male and 21,231 (57%) were Female. These gender percentages were comparable to the non-preventable readmission populations. The age group between 50 and 74 had the greatest number of admissions (40%) and preventable readmissions (40.3%).

Of the 36,964 preventable readmission cases studied, 978 (3%) died. Routine discharges accounted for 26,381 (71%) of the overall discharges.

Of the non-preventable readmission cases, 3.9% (1,635) of the male discharges resulted in death, while 1.7% (1,577) of the female discharges resulted in deaths.

Of the 3,212 non-preventable readmission deaths, 2,391 (74.4%) were white, 352 (11.0%) were black, 299 (9.3%) were Hispanic, and the remaining 170 (5.3%) were other races. Of the 3,212 non-preventable readmission deaths, 2,068 (64.4%) entered care through the emergency room, 776 (24.2%) entered through routine, 177 (5.5%) through skilled nursing, and the remaining cases through other sources. One percent of Routine admission sources resulted in deaths, while 4.4% of the emergent cases resulted in deaths. The preventable readmission cases depicted no statistically significant differences when comparing non-preventable readmissions by race, gender, source of admission, type of admission, DRG, length of stay, and payer type.

Table 9 presents the data abstraction and analysis. In this table, Medi-Cal and HMO sample cases are divided by

total episodes and preventable readmission episodes. Comparisons have been made to show the differences between the Medi-Cal and HMO preventable readmissions cases by demographic characteristic, case modes, disposition, and admission type.

The data show minor differences in the overall percentage of preventable readmissions between Medi-Cal (20% readmitted) and HMO (20% readmitted) cases.

There was a difference between genders; male Medi-Cal payer beneficiaries experienced a 34% preventable readmission rate while HMO payer beneficiaries experienced a 24% preventable readmission rate. The female Medi-Cal payer beneficiaries experienced 15% preventable readmission rate while the HMO payer beneficiaries experience a 14% preventable readmission rate.

The significantly dissimilar age categories were between 41 and 65 years of age. In these age categories, Medi-Cal payer beneficiaries experienced 11-14 percent higher preventable readmission rates than HMO payer beneficiaries did. The other age categories were comparable. The mean overall age of the Medi-Cal payer beneficiaries was

32, while the mean age of the HMO payer beneficiaries was 41. The mean age of the Medi-Cal preventable readmission population was 38, while the mean age of the HMO readmitted population was 47. In both categories, the HMO population was older. Race did not depict any significant differences among overall and readmitted HMO and Medi-Cal populations.

Table 9 also includes the top 5 DRGs from the payer populations, 7 categories of disposition, 5 categories of admission type, and mean utilization figures. The top DRGs show no significant differences among overall, readmitted, HMO, and Medi-Cal cases.

The only two disposition categories with significantly different preventable readmission rates were for Other facility and Structured Nursing Facility (SNF) discharges.

The Medi-Cal preventable readmission discharges to Other Facilities were 17.5% greater than the HMO preventable readmission discharges, while the Medi-Cal preventable readmission discharges to SNF were 11.5% greater than the HMO preventable readmission discharges.

The type of admission category having the greatest difference between Medi-Cal and HMO preventable readmissions

was the Elective category. Medi-Cal Elective preventable readmissions were 16% higher than HMO Elective preventable readmissions.

The mean number of diagnoses, mean number of procedures, mean number of admissions, and mean lengths of stays were similar between the overall Medi-Cal and HMO cases. However, the Medi-Cal readmission cases revealed mean number of admits and mean lengths of stay that were greater than the HMO mean data. In addition, the mean number of diagnoses, mean number of admissions, and mean length of stays were significantly higher for the preventable readmission cases of both Medi-Cal and HMO payer beneficiaries compared to the overall cases. (The overall cases are both non-readmitted and readmitted cases.)

Top Five Counties

Table 5 Top 5 Counties by Admissions

COUNTY	# OF CASES	% OF CASES
Alameda	40,513	23.9
Contra Costa	25,910	15.3
Los Angeles	23,719	14.0
Fresno	22,667	13.4
Kern	18,757	11.1
		77.6

Table 6 Top 5 Counties by Preventable Readmissions

COUNTY	# OF CASES	% OF CASES
Alameda	10,471	28.3
Contra Costa	6,381	17.3
Fresno	4,603	12.5
Los Angeles	4,294	11.6
Kern	4,020	10.9
		80.6

Table 7 Top 5 Counties by HMO Cases

COUNTY	# OF CASES	% OF CASES
Alameda	10,093	35.7
Contra Costa	7,282	25.7
Los Angeles	3,625	12.8
Fresno	2,862	10.1
Kern	1,312	4.6
		88.9

Table 8 Top 5 Counties by Medi-Cal Cases

COUNTY	# OF CASES	% OF CASES
Alameda	7,426	19.9
Fresno	6,979	18.7
Los Angeles	6,700	17.9
Kern	4,362	11.7
Contra Costa	3,303	8.8
		77.0

Table 9 Top 5 Counties by All Payers

COUNTY	# OF CASES	% OF CASES
Alameda	22,994	22.2
Contra Costa	15,325	14.8
Los Angeles	13,394	12.9
Kern	13,083	12.6
Fresno	12,826	12.4
		74.9

Tables 4 through 8 reveal the top readmission and

overall cases by payer source and county. These tables

reveal that Alameda County has the highest number of

admissions by HMO, Medi-Cal and all-payer sources. In

addition, Alameda had the highest readmission rate of 28.3%

of all cases; although, Alameda represented only 23.9% of

the overall cases. These data show a disproportionate number

of readmissions in Alameda County when compared to the other

payer source counties.

Table 10 Medi-Cal and HMO Tabulated Data Results

DESCRIPTION	# OF CASES MEDI-CAL	# OF CASES HMO	# OF READMIT MEDI-CAL	# OF READMITS HMO	% OF CASES READMITTED MEDI-CAL	% OF CASES READMITTED HMO	% OF CASES READMITTED DIFFERENCE
# of Medical Admits	26,823	16,313	5,368	3,220	20.0%	19.7%	0.3%
# of Surgical Admits	10,188	11,707	1,380	1,344	13.5%	11.5%	2.1%
TOTAL	37,011	28,020	6,748	4,564	18.2%	16.3%	1.9%
% of All Cases	22%	17%	0%	0%	0.0%	0.0%	0.0%
Sex Male	6,235	7,783	2,095	1,866	33.6%	24.0%	9.6%
Female	31,134	20,518	4,782	2,777	15.4%	13.5%	1.8%
Age 1-10	1,077	152	302	51	28.0%	33.6%	-5.5
11-20	7,905	1,498	1,046	216	13.2%	14.4%	-1.2
21-30	13,638	7,686	1,505	784	11.0%	10.2%	0.8%
31-40	6,782	7,086	1,252	768	18.5%	10.8%	7.6%
41-50	2,730	4,098	854	773	31.3%	18.9%	12.4
51-60	2,449	3,742	909	988	37.1%	26.4%	10.7
61-65	1,290	1,869	504	471	39.1%	25.2%	13.9
66-75	787	1,240	257	347	32.7%	28.0%	4.7%
76+	712	934	248	245	34.8%	26.2%	8.6%
Mean Age	32	41	38	47	120.3%	113.7%	6.6%
Race							
White	13,744	19,574	2,785	3,369	20.3%	17.2%	3.1%
Black	7,648	3,009	1,845	537	24.1%	17.8%	6.3%
Hispanic	11,929	3,429	1,627	462	13.6%	13.5%	0.2%
Native Amer.	224	49	23	2	10.3%	4.1%	6.2%
Asian	3,277	1,843	497	223	15.2%	12.1%	3.1%
Other	548	397	100	50	18.2%	12.6%	5.7%
Top 5 DRGs	—Ranked by Payer Cases—						
#1–Number	373	373	373	373			
#1–Cases	12,721	6,426	495	217	3.9%	3.4%	0.5%
#2–Number	371	371	371	371			
#2–Cases	3,048	1,869	160	75	5.2%	4.0%	1.2%
#3–Number	370	359	370	359			
#3–Cases	1,080	1,343	95	51	8.8%	3.8%	5.0%
#4–Number	372	372	372	372			
#4–Cases	1,068	569	80	30	7.5%	5.3%	2.2%
#5–Number	430	143	430	143			
#5–Cases	824	539	285	73	34.6%	13.5%	21.0
Disposition							
Died	370	297	114	75	30.8%	25.3%	5.6%
Home Health	949	736	366	255	38.6%	34.6%	3.9%
Against Advice	430	96	168	32	39.1%	33.3%	5.7%
Other Facility	224	79	96	20	42.9%	25.3%	17.5
SNF	599	355	248	106	41.4%	29.9%	11.5
ST Acute Care Facility	458	617	166	223	36.2%	36.1%	0.1%
Routine	34,340	26,121	5,719	3,932	16.7%	15.1%	1.6%
Type of Admission							
Emergency	4,448	1,596	1,421	363	31.9%	22.7%	9.2%
Urgent	10,468	9,755	3,390	2,754	32.4%	28.2%	4.2%
Elective	3,729	7,084	1,192	1,134	32.0%	16.0%	16.0
Delivery	18,722	9,840	873	384	4.7%	3.9%	0.8%
Unknown	3	26	1	8	33.3%	30.8%	2.6%
Mean # of Diagnoses	2.8	2.8	3.4	3.2	120.1%	115.2%	4.9%
Mean # of Procedures	1.9	1.8	1.7	1.7	85.9%	91.8%	-5.9
Mean # of Admits	1.0	1.0	3.2	2.5			
Mean Length of Stay	3.6	3.3	5.4	4.8			

Table 10 reveals preventable readmissions of all payers and payers other than HMO and Medi-Cal. The purpose of these groups was to measure the preventable readmission rates among non-HMO/Medi-Cal payer beneficiaries, all payer beneficiaries, HMO payer beneficiaries, and Medi-Cal payer beneficiaries. There were no significant variations among gender, age, race, dispositions, and type of admission when all payers and non-HMO/Medi-Cal payer beneficiaries were compared. When comparing the four payer groups (HMO, Medi-Cal, All, and All Others), the HMO preventable readmissions rates were lowest in nearly all categories (age, race, gender, top DRGs, disposition, and type of admission). The only negative difference is the 25.3% HMO mortality rate compared to the 22.4% of All Other and the 23.3% rate of All payer preventable readmissions. Although it is impossible to determine the exact severity of illness differences among the payer groups, the top 5 DRGs, which comprise over 80% of the episodes, are the same for all of the payer groups.

The mean ages of the All and All Other payer categories are 47.5 and 56.6 years, respectively. The mean ages of the

All and All Other preventable readmission payer categories
are 57.7 and 65.0 years, respectively.

These mean ages are significantly higher than the HMO
and Medi-Cal mean ages.

It is expected that the mean ages for the *All* and *All
Other* payer categories would be higher because of the
Medicare payer populations.

Table 11 Other Payers and All Payers Data Results

DESCRIPTION	# OF CASES OTHER PAYERS	# OF CASES ALL PAYERS	# OF READMITS OTHERS	# OF READMITS ALL	% OF CASES READMITTED OTHERS	% OF CASES READMITTED ALL	% OF CASES READMITTED DIFFERENCE
# of Medical Admits	61,697	104,833	17,458	26,046	28.3%	24.8%	3.5
# of Surgical Admits	40,333	62,228	7,546	10,270	18.7%	16.5%	2.2
TOTAL	102,030	167,061	25,004	36,316	24.5%	21.7%	2.8
% of All Cases	61%	100%			0.0%	0.0%	0.0
Sex Male	43,313	57,331	11,772	15,733	27.2%	27.4%	-0.3
Female	60,383	112,035	13,672	21,231	22.6%	19.0%	3.7
Age 1-10	223	1,452	43	396	19.3%	27.3%	-8.0
11-20	2,317	11,716	270	1,532	11.7%	13.1%	-1.4
21-30	12,578	33,902	1,428	3,717	11.4%	11.0%	0.4
31-40	12,709	26,577	1,745	3,765	13.7%	14.2%	-0.4
41-50	8,958	15,786	1,854	3,481	20.7%	22.1%	-1.4
51-60	8,898	15,089	2,435	4,332	27.4%	28.7%	-1.3
61-65	6,894	10,053	1,993	2,968	28.9%	29.5%	-0.6
66-75	24,273	26,300	7,497	8,101	30.9%	30.8%	0.1
76+	26,846	28,492	8,179	8,672	30.5%	30.4%	0.0
Mean Age	56.6	47.5	65.0	57.7			
Race							
White	76,764	110,082	18,653	24,807	24.3%	22.5%	1.8
Black	9,869	20,526	3,163	5,545	32.0%	27.0%	5.0
Hispanic	12,426	27,784	2,699	4,788	21.7%	17.2%	4.5
Native Amer.	293	566	73	98	24.9%	17.3%	7.6
Asian	3,351	8,471	656	1,376	19.6%	16.2%	3.3
Other	993	1,938	200	350	20.1%	18.1%	2.1
Top 5 DRGs	—Ranked by Payer Cases—						
#1–Number	373	373	373	373			
#1–Cases	7,304	26,451	196	908	2.7%	3.4%	-0.7
#2–Number	127	371	127	371			
#2–Cases	5,390	7,361	2,295	337	42.6%	4.6%	38.0
#3–Number	140	127	140	127			
#3–Cases	2,993	6,384	1,018	2,773	34.0%	43.4%	-9.4
#4–Number	209	359	209	359			
#4–Cases	2,554	3,944	497	160	19.5%	4.1%	15.4
#5–Number	371	140	371	140			
#5–Cases	2,444	3,889	102	1,309	4.2%	33.7%	-29.5
Disposition							
Died	3,523	4,190	789	978	22.4%	23.3%	-0.9
Home Health	9,314	10,999	3,334	3,955	35.8%	36.0%	-0.2
Against Advice	866	1,392	274	474	31.6%	34.1%	-2.4
Other Facility	1,741	2,044	559	675	32.1%	33.0%	-0.9
SNF	8,252	9,206	2,750	3,104	33.3%	33.7%	-0.4
ST Acute Care Facility	2,815	3,890	1,008	1,397	35.8%	35.9%	-0.1
Routine	77,185	137,646	16,730	26,381	21.7%	19.2%	2.5
Type of Admission							
Emergency	16,400	22,444	4,451	6,235	27.1%	27.8%	-0.6
Urgent	50,079	70,302	14,824	20,968	29.6%	29.8%	-0.2
Elective	25,938	36,751	5,756	8,082	22.2%	22.0%	0.2
Delivery	11,399	39,961	396	1,653	3.5%	4.1%	-0.7
Unknown	60	89	17	26	28.3%	29.2%	-0.9
Mean # of Diagnoses	3.3	3.1	4.0	3.7			
Mean # of Procedures	2.0	2.0	2.0	1.9			
Mean # of Admits	5.2	4.5	6.6	6.2			
Mean Length of Stay	1.0	1.0	2.6	2.7			

Table 11 depicts the odds ratio calculations for payer preventable readmissions. In addition, the r squared, odds ratio, and relative risk. The Medi-Cal and All Payer table depicts a weak negative correlation (r) of -0.03, a slight negative relative risk of 0.843, and slight negative odds ratio of 0.808.

The HMO and All Payer table depicts a weak negative correlation of -0.054, a moderate negative relative risk of 0.711, and a moderate negative odds ratio of 0.658. The All Others and All Payers table depicts the a weak correlation of 0.031, a weak positive relative risk of 1.12, and a weak positive odds ratio of 1.17. The Medi-Cal and HMO table shows a very weak correlation of 0.026, a weak positive relative risk of 1.12, and a weak positive odds ratio of 1.15. In other words, Medi-Cal cases are 1.12 times more likely than HMO cases to be readmitted.

The Medi-Cal and All Others preventable readmissions table shows a moderate negative correlation of -0.064, a moderate negative relative risk of 0.75, and a moderate odds ratio of 0.69.

The HMO and All Others table show a moderate negative correlation of -0.08, moderate to significant negative relative risk of 0.66, and a moderate to significant negative odds ratio of 0.60.

In other words, All Others cases are 1.40 times more likely to experience preventable readmissions than HMO cases.

The Medical and Surgical Admits table depicts a significant correlation of 0.098, a strong relative risk ratio of 1.51, and a strong odds ratio of 1.67. In other words, Medical admissions are 1.5 times more likely to experience preventable readmissions than surgical admissions. The White and Non-white table statistics are nearly similar. The Male and Female table depicts a significant correlation of 0.097, a strong relative risk of 1.45, and a strong odds ratio of 1.62. In other words, Males are more likely to experience preventable readmissions than Females.

Table 12 depicts the two-by-two tables of various payers, race, gender, and mortality.

The Medi-Cal and All Payer table depicts a weak negative correlation (r) of -0.04, a strong negative relative risk of 0.40, and strong negative odds ratio of 0.39. In words, All Other payer cases are 1.6 times more likely to die than Medi-Cal cases; which, is expected due to the inclusion of the Medicare elderly population in the All Others category.

The HMO and All Payer table depicts a weak negative correlation of -0.033, a strong negative relative risk of 0.424, and a strong negative odds ratio of 0.418.

In other words, HMO payer beneficiaries are 1.6 times less likely to experience death when compared with All Payer beneficiaries.

The Medi-Cal and All Payer mortality table shows a moderate correlation of 0.069, a strong relative risk ratio of 2.123, and a strong odds ratio of 2.186. This table suggests that Medi-Cal patients are 2.12 times more likely to die than the All Payer patients are. The most significant results were revealed in the Medi-Cal and HMO mortality table.

There was a strong correlation of 0.10, a very strong relative risk ratio of 5.01, and a very strong odd ratio of 5.23. This table indicates a chance five-fold of dying if a Medi-Cal beneficiary than a HMO beneficiary.

The Medical and Surgical Admits mortality table depicts a weak correlation of 0.027, a moderate relative risk ratio of 1.45, and a moderate odds ratio of 1.47.

The White and Non-white table shows a weak correlation of 0.028, a moderate to strong relative risk ratio of 1.457, and a moderate to strong odds ratio of 1.507.

The Male and Female table depicts a moderate correlation of 0.056, a strong relative risk of 1.99, and a strong odds ratio of 2.04. In other words, Males are 1.99 times more likely to experience death than Females. Finally, the Readmit and Non-readmit mortality table is similar.

Table 12 Two by Two Tables of Readmitted Cases

2 x 2 Tables

	Readmitted	Non-Readmitted			r	Rate Ratio	Odds Ratio
Medi-Cal	6,877	30,493	37,370		-0.032	0.843	0.808
All Payers	36,964	132,403	169,367				
	43,841	162,896	206,737				

	Readmitted	Non-Readmitted					
HMO	4,346	23,658	28,004		-0.054	0.711	0.658
All Payers	36,964	132,403	169,367				
	41,310	156,061	197,371				

	Readmitted	Non-Readmitted					
All Others	25,444	78,252	103,696		0.031	1.124	1.165
All Payers	36,964	132,403	169,367				
	62,408	210,655	273,063				

	Readmitted	Non-Readmitted					
Medi-Cal	6,877	30,493	37,370		0.026	1.122	1.149
HMO	4,643	23,658	28,301				
	11,520	54,151	65,671				

	Readmitted	Non-Readmitted					
Medi-Cal	6,877	30,493	37,370		-0.064	0.750	0.694
All Others	25,444	78,252	103,696				
	32,321	108,745	141,066				

	Readmitted	Non-Readmitted					
HMO	4,643	23,658	28,301		-0.080	0.669	0.604
All Others	25,444	78,252	103,696				
	30,087	101,910	131,997				

	Readmitted	Non-Readmitted					
Medical Admits	26,046	78,787	104,833		0.098	1.505	1.673
Surgical Admits	10,270	51,958	62,228				
	36,316	130,745	167,061				

	Readmitted	Non-Readmitted					
White	24,807	85,275	110,082		0.023	1.099	1.128
Non-White	12,157	47,128	59,285				
	36,964	132,403	169,367				

	Readmitted	Non-Readmitted					
Male	15,733	41,598	57,331		0.097	1.448	1.618
Female	21,231	90,804	112,035				
	36,964	132,402	169,366				

Table 13 Two by Two Tables of Mortality Cases

2 x 2 Tables

	Death	Non-Death			r	Relative Risk	Odds Ratio
Medi-Cal	370	37,000	37,370		-0.039	0.400	0.394
All Payers	4,190	165,177	169,367				
	4,560	202,177	206,737				
	Death	Non-Death					
HMO	297	28,004	28,301		-0.033	0.424	0.418
All Payers	4,190	165,177	169,367				
	4,487	193,181	197,668				
	Death	Non-Death					
Medi-Cal	3,087	55,678	58,765		0.069	2.123	2.186
All Payers	4,190	165,177	169,367				
	7,277	220,855	228,132				
	Death	Non-Death					
Medi-Cal	3,087	55,678	58,765		0.102	5.006	5.228
HMO	297	28,004	28,301				
	3,384	83,682	87,066				
	Death	Non-Death					
Medical Admits	2,876	101,957	104,833		0.027	1.457	1.470
Surgical Admits	1,172	61,056	62,228				
	4,048	163,013	167,061				
	Death	Non-Death					
White	3,079	107,003	110,082		0.028	1.493	1.507
Non-White	1,111	58,174	59,285				
	4,190	165,177	169,367				
	Death	Non-Death					
Male	2,119	55,212	57,331		0.056	1.999	2.038
Female	2,071	109,964	112,035				
	4,190	165,176					
	Death	Non-Death					
Readmit	978	35,986	36,964		0.006	1.091	1.093
Non-Readmit	3,212	129,191	132,403				
	4,190	165,177					

Summary

The data show that HMOs have better mortality and preventable readmission rates than all of the other payer types. The Medi-Cal populations are younger, yet have greater preventable readmission and mortality rates than the HMO populations. The top five diagnoses for Medi-Cal and HMO populations are nearly the same.

Hypothesis Testing

HMO and Medi-Cal Payer beneficiaries

The preventable readmission and mortality variables have been dichotomized to zero and one values to provide percentage results. The zero value represents non-preventable readmission and non-mortality. The value of one represents positive preventable readmission and positive mortality.

Readmissions

The results depicted in table 11 reveal an odds ratio of 1.149 for readmitted Medi-Cal versus HMO readmitted hospital discharge cases. The Medi-Cal readmitted versus All Payers readmissions reveals an odds ratio of 0.808.

Also, the HMO readmitted versus All Payers readmissions reveals an odds ratio of 0.658. These data show that Medi-Cal payer plan readmissions are more likely to occur than HMO payer plan beneficiary readmissions.

The conclusion of these results is therefore to accept the null hypothesis that Medi-Cal payer plan beneficiaries would not experience higher risks of readmissions if enrolled in HMO payer plans.

Mortality

The results depicted in table 12 reveal a strong odds ratio of 5.228 for Medi-Cal deaths versus HMO deaths. The Medi-Cal deaths versus All Payer deaths reveals an odds ratio of 0.394.

Also, the HMO deaths versus All Payer deaths reveals an odds ratio of 0.418. These data show that Medi-Cal payer plan deaths are far more likely to occur than HMO payer plan beneficiary readmissions.

The conclusion of these results is therefore to accept the null hypothesis that Medi-Cal payer plan beneficiaries would not experience higher risks of deaths if enrolled in HMO payer plans.

Summary

The result of the Odds Ratio statistical test is to accept the null hypothesis that no statistical difference exists between Medi-Cal and HMO discharges.

Discussion

In an effort to control health care costs and provide quality health care, many states are enrolling public aid populations in HMOs and other forms of managed care plans. In 1981 there were 280,000 Medicaid payer beneficiaries enrolled in HMOs compared with 2.7 million in 1987. Government agencies expect managed care plans to yield cost savings, or at least slow the rate at which health care costs are increasing, by greater preventive care and controlled utilization.

During the late 1980s, the expanded pursuit of Medicaid managed care contracting has led states to seek federal HCFA waivers from the freedom-of-choice clause.

In some states, enrollment in HMOs or some capitated organizational form is mandatory. However, the health care organizations have not always been eager to provide coverage to the Medicaid population. The frequency of eligibility, high utilization rates, and chronic conditions associated with the Medicaid populations coupled with the reimbursement rates below traditional fee-for-service rates have made the Medicaid population less financially desirable.

Moreover, the managed care organizations have been scrutinized and criticized by health care advocates for discouraging utilization.

The Center for Public Representation of Milwaukee reported many examples of discouraged utilization among mandatory Medicaid HMO plans. The study cites examples of avoidance of specialist referrals and a lack of prenatal and family planning services. The study also depicts a lack of beneficiary knowledge about the system and services available to members and discontinuities in prenatal care.

California has been very successful with managed care. Although there have been limited resources per beneficiary, higher than average unemployment and underemployment, high immigration, lower tax revenues, diminishing federal funds, higher tax burdens, and environmental impairments, the health status indicators and outcomes appear to be favorable when compared with the national data. Overall, the Medi-Cal fee-for-service data show no statistically significant differences when compared with the HMO data. In some cases, the HMOs have more favorable outcomes.

The HMOs in California have been evolving and maturing

for decades and have led the nation in refining and

exploring more efficient and effective care. Clearly, the

outcomes satisfy Donabedian's definition of quality care,

that which does more good than harm, and which is efficient

and effective. California HMOs seem to be maximizing the

utility of scarce and diminishing resources.

The type of health insurance plan one belongs to will

determine the use of health care services according to the

Andersen behavioral model. Health plans fit into the

enabling segment of the model and their influences span

across system differences, financial barriers, access,

community resources, and social support. In the Donabedian

model, health insurance plans span across structure and

process of the three-segment model. Both models lend

validity to health care assessment.

The selection of preventable readmissions and mortality

as indicators of the quality of care were selected because

they are clear events that can be measured, increase the

costs to patients or providers, and result in undesirable

consequences.

The choice of outcome measures from among the range of possibilities presents a challenge to researchers and health care professionals. It was my choice to select mortality because death is certainly an unwanted, and in most cases costly, outcome. Preventable readmissions are unwanted by the health care professionals, patients, payers, and society because they are costly in real and indirect terms. Although preventable readmission and mortality rates in this research fail to identify the discrete causes of their outcome, they edify changes or differences from some baseline of acceptable limits. If the diagnoses, severity of illness, and demographic characteristics of populations are the same, real difference in the quality of care should not exist.

In terms of policy development, a greater impact assessment must be compiled to determine the baseline of care, the demographic needs of the various communities, and audit guidelines. The increased enrollment of Medi-Cal payer beneficiaries in HMOs will yield improvements in care and costs if outcome measurements and verification audit mechanisms correspond.

Alternatively, the continued lack of policies, verification mechanisms, and regulations may yield adverse outcomes for Medi-Cal payer beneficiaries and more costs to society, health care providers, and payers. Moreover, The DHS should develop Medi-Cal reimbursement policies directly linked to the various dimensions of quality of care

The enrollment of Medicaid and Medicare payer beneficiaries in HMOs theoretically provides incentives for the early hospital discharge. However, the analysis of the 1991 California data does not support this premise.

Literature related to this subject, in general, suggest that early discharges may increase the risk of subsequent preventable readmission if all necessary medical care is not completed during a patient's first hospital stay. Therefore, further research and close monitoring should continue to create more explicit causal linkages.

The Health Care Financing Administration (1988) requires that preventable readmissions within 31 days of discharge be reviewed by peer review organizations to determine if the preceding discharge was premature or if other quality problems existed and should entice providers

to maintain quality. However, coding bias may cause some cases to avoid review.

In 1993, the department released a "strategic plan" intended to rapidly move the Medi-Cal Program toward a "managed care" approach for providing services to Medi-Cal payer beneficiaries. In this section, I make several recommendations regarding the department's proposed expansion.

The Legislature and the department have, for several years, attempted to increase the number of Medi-Cal payer beneficiaries enrolled in managed care arrangements. In particular, legislation accompanying the 1992 Budget Act gave the department broad authority to expand managed care in California, with the goals of improving beneficiary access to care and making the Medi-Cal Program more cost-effective.

Approximately 1 million out of 5.5 million Medi-Cal payer beneficiaries were enrolled in a managed care arrangement by the end of 1994-95. The department anticipates this number will increase to a total of 2.5 million by the end of 1995-96.

Under managed care arrangements, the Medi-Cal Program attempts to control costs by generally reimbursing providers on a "capitated," or per-person basis regardless of the number of services any given individual uses. In addition, the use of specialists and high-cost services require a physician referral. This approach contrasts with the fee-for-service system, where Medi-Cal pays providers for each service they provide, and the beneficiary has his or her choice in selecting providers. In fee-for-service, utilization is controlled by requiring prior authorization from the Medi-Cal field offices for the more expensive medical services.

The principal managed care arrangements are:

Medi-Cal contracts with private Prepaid Health Plans (PHPs) to provide care to AFDC-linked payer beneficiaries.

The PHPs are paid a monthly capitation payment, based on an estimate of the costs of serving payer beneficiaries in the fee-for-service system. The department generally has not entered into contracts to enroll SSI/SSP-linked payer beneficiaries in PHPs. Under the approach of County-Organized Health Systems (COHS), the county acts as a

prepaid plan, serving all Medi-Cal payer beneficiaries in the county. The COHS receive a capitated rate for each beneficiary in the county, and assume full financial risk. Currently, Santa Barbara, San Mateo, and Solano Counties have fully implemented this approach, and two additional counties--Orange and Santa Cruz--will begin very soon. Federal law prohibits additional county-organized systems in California beyond these five.

Under the approach of Geographic Managed Care (GMC), the Medi-Cal Program negotiates contracts directly with providers to accept payer beneficiaries within a specified area, paying a monthly rate based on the estimated cost of providing services to similar payer beneficiaries under the fee-for-service system.

The department implemented this approach in Sacramento County April of 1994, and intends to implement a second project in San Diego County.

Primary Care Case Management (PCCM) plans are paid a fixed monthly fee (per capita) to manage the care of the Medi-Cal payer beneficiaries enrolled in the plan. They approve referrals to specialists, non-emergency

hospitalizations, and other high-cost procedures. If the costs of care for enrollees in a PCCM plan are less than the estimated fee-for-service cost would have been for similar payer beneficiaries, the PCCM plan receives a payment equal to half the estimated savings.

The department's strategic plan and the budget propose to enroll nearly half of all beneficiaries (2.5 million out of an estimated 5.5 million) in a managed care arrangement by late 1995-96. The plan proposes to expand the number of beneficiaries served under managed care arrangements primarily by implementing the aforementioned managed care strategies and expanding managed care models to additional counties.

I suggest that the department enact legislation which would require the inclusion of newly enrolled SSI/SSP-linked beneficiaries in the counties targeted for managed care changes to enroll in managed care plans while allowing existing beneficiaries to remain under FFFS arrangements for the next two years. This would allow the current continuum of care to remain stable for providers and beneficiaries for a transitional period of time.

In addition, I recommend greater research, planning, and implementation of clinical guidelines for the top 80% most costly procedures. The literature strongly suggests that significant savings can be realized by minimizing the wide variations of inappropriate care.

Also, the development and fostering of strategic partnerships among the government agencies, pharmaceutical industry, hospitals, practitioners, business, and academic organizations may yield efficient solutions to serious health care issues.

I believe that the Medi-Cal populations will benefit from the HMO continuum of care that is incented to promote better health and which is structurally more consistent than the fragmented fee-for-service structure. The HMO preventable readmission and mortality rates depict better outcomes, include a more mainstream population, and would better control the continuum of care for Medi-Cal payer beneficiaries. In addition, greater regulation of HMOs is becoming more prevalent; which, safeguard the patient's rights.

Finally, the ultimate problem facing all Americans is

how to allocate scarce resources to all that is fair,

efficient, and politically acceptable. The goal of health

care leaders is to develop methods which ensure that the

decisions are not random. The use of outcomes analysis is a

good tool for organizing, delivering, and monitoring

efficient and equitable care. The Medicaid population is

comprised of a population, which is markedly different from

those historically, enrolled in HMOs.

The needs of these low-income women and children,

disabled, elderly, and ethnically diverse populations

include greater understanding of their specific needs,

timely-assessments and response, simplified geographic

access, greater education to empower the beneficiary, and

greater understanding about the environment within which

they live.

APPENDIX--TABLE OF DATA FIELD DEFINITIONS

<u>Variable Description</u>
AGE

PAYMENT SOURCE
        1=Medicare
        2=Medi-Cal
        3=Worker's Compensation
        4=Title V
        5=Other Government
        6=Blue Cross/Blue Shield
        7=Insurance Company
        8=HMO/PHP
        9=Self-Pay
        10=No Charge
        11=Other Non-Government"
        12=Medically Indigent (Sec. 1700)
PRINCIPAL DIAGNOSIS
OTHER DX 1
OTHER DX 2
OTHER DX 3
OTHER DX 4
RACE
        1=White
        2=Black
        3=Hispanic
        4=Native Am./Eskimo
        5=Asian
        6=Other
        7=Unknown
SEX
        1=Male
        2=Female
        3=Other
        4=Unknown
ZIP CODE
COUNTY OF RESIDENCE
        1=Alameda
        2=Alpine

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3=Amador
4=Butte
5=Calaveras
6=Colusa
7=Contra Costa
8=El Norte
9=El Dorado
10=Fresno
11=Glenn
12=Humboldt
13=Imperial
14=Inyo
15=Kern
16=Kings
17=Lake
18=Lassen
19=Los Angeles
20=Madera
21=Marin
22=Mariposa
23=Mendocino
24=Merced
25=Modoc
26=Mono
27=Monterey
28=Napa
29=Nevada
30=Orange
31=Placer
32=Plumas
33=Riverside
34=Sacramento
35=San Benito
36=San Bernardino
37=San Diego
38=San Francisco
39=San Joaquin
40=San Luis Obispo
41=San Mateo
42=Santa Barbara
43=Santa Clara
44=Santa Cruz

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                45=Shasta
                46=Sierra
                47=Siskiyou
                48=Solano
                49=Sonoma
                50=Stanislaus
                51=Sutter
                52=Tehama
                53=Trinity
                54=Tulare
                55=Tuolumne
                56=Ventura
                57=Yolo
                58=Yuba
RECORD NUMBER
HOSPITAL
ADMISSION SOURCE
                11=Routine
                12=Emergency Room
                13=Short-Term Acute Care Hospital
                14=Intermediate Care Facility
                15=Skilled Nursing Facility
                16=Other Facility
                17=Home Health Service
                18=Newborn
                19=Other
ADMISSION TYPE
                1=Emergency
                2=Urgent
                3=Elective
                4=Newborn
                5=Delivery
                6=Unknown/Other
DRG
PRINCIPAL PROCEDURE
OTHER PROC. 1
OTHER PROC. 2
OTHER PROC. 3
OTHER PROC. 4
LENGTH OF STAY
ADMIT DATE CODE
DISPOSITION
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          1=Routine Discharge
          2=Short-Term Acute Care Hospital
          3=Intermediate Care Facility
          4=Skilled Nursing Facility
          5=Other Healthcare Facility
          6=Against Medical Advice
          7=Home Health Service
          8=Died
ADMISSION DAY
          1=Sunday
          2=Monday
          3=Tuesday
          4=Wednesday
          5=Thursday
          6=Friday
          7=Saturday
ADMISSION MONTH/YEAR
REPORT SOURCE
          1=General Acute Care Report
          2=Skilled Nursing/Intermediate Care Report
          4=Psychiatric Care Report
          5=Alcohol/Drug Rehabilitation Report
          6=Rehabilitation Report
HOSPITAL COUNTY
          1=Alameda
          2=Alpine
          3=Amador
          4=Butte
          5=Calaveras
          6=Colusa
          7=Contra Costa
          8=Del Norte
          9=El Dorado
          10=Fresno
          11=Glenn
          12=Humboldt
          13=Imperial
          14=Inyo
          15=Kern
          16=Kings
          17=Lake
          18=Lassen
```

```
                19=Los Angeles
                20=Madera
                21=Marin
                22=Mariposa
                23=Mendocino
                24=Merced
                25=Modoc
                26=Mono
                27=Monterey
                28=Napa
                29=Nevada
                30=Orange
                31=Placer
                32=Plumas
                33=Riverside
                34=Sacramento
                35=San Benito
                36=San Bernardino
                37=San Diego
                38=San Francisco
                39=San Joaquin
                40=San Luis Obispo
                41=San Mateo
                42=Santa Barbara
                43=Santa Clara
                44=Santa Cruz
                45=Shasta
                46=Sierra
                47=Siskiyou
                48=Solano
                49=Sonoma
                50=Stanislaus
                51=Sutter
                52=Tehama
                53=Trinity
                54=Tulare
                55=Tuolumne
                56=Ventura
                57=Yolo
                58=Yuba
# OF DIAGNOSES
# OF PROCEDURES
```

ADMISSIONS
MDC—MAJOR DIAGN. CAT.
MEDICAL/SURGICAL
        1=Surgical DRG
        2=Medical DRG
MULTIPLE ADMISSIONS
        0=No
        1=Yes
ADMIT DATE
ADMITS IN MONTH
AGE CATEGORIES
        0=Outlier
        1=1-10
        2=11-20
        3=21-30
        4=31-40
        5=41-50
        6=51-60
        7=61-65
        8=66-75
        9=76+
OTHERPAY
        1.00=ALL OTHERS
        2.00=MEDI-CAL
        8.00=HMO
MORTALITY
        0=non-death
        1=death
PAYER
        0=Medi-Cal
        1=HMO

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