

What is a Health System? Why Should We Care?

By

William C. Hsiao
K.T. Li Professor of Economics and Health Policy
Harvard School of Public Health

August, 2003

What Is A Health System? Why Should We Care?

Abstract

Health system reforms and health system comparisons have been popular topics of discussion for the policy and research communities. Yet, there is no **clear** concept and definition for a health system. As a result, comparisons are often made between apples and oranges, resulting in confused discourses and misleading conclusions.

This paper argues that for policy and economic research purposes, it is most useful to conceptualize a health system as **a set of relationships in which the structural components (means) and their interactions are associated and connected to the goals the system desires to achieve (ends)**. The model identifies three common goals and five means that nations use to achieve their goals. The differences in the structural components may explain the variety of observed system outcomes.

Keywords: health systems comparisons, health system performance, reforms, policy model

Acknowledgement

The paper benefited greatly from discussions with my colleagues Peter Berman, Michael Reich, Marc Roberts, and Winnie Yip, and from the comments of the participants of the annual World Bank's Flagship Courses since 1997. Carrie Thiessen improved the paper immensely by her insightful comments and her able research assistance. Any error remains the sole responsibility of the author.

Introduction

Globally, the policy and research communities have heatedly debated health system reforms. Health systems have been dissected, analyzed, evaluated and compared. However, there is no common and consistent answer to the question *what is a health system?* The term ‘health system’ has been defined differently for different purposes. The ambiguous concepts and meanings of a health system have caused confusion in public debate and misled policy deliberations. Policy makers have a specific interest in the development of an adequate and consistent definition that will enable them to understand what instruments (interventions) are likely to improve the performance of a health system. At the same time, they want to learn from the “better” systems to reform their own. Researchers want to investigate what structural components cause the varied outcomes.

Health systems have been conceptualized and defined in various ways. Traditionally, health systems were described in terms of capacity indicators and activities (e.g. number of hospital beds, physicians and nurses, government programs.) [1], [2]. Roemer also argued that a health system should be described by five characteristics: productive resources, organization of programs, economic support mechanisms, management methods and service delivery. However, his conceptualization of health system does not adequately explain why these categories of activity matter or what difference it makes when the configuration of these characteristics varies. Hurst took a different approach, describing health systems as a series of fund flows and payment methods between population groups and institutions [3]. Both approaches are informative, but neither explains *why* and *how* a particular system produces a set of outcomes.

Another body of literature presents a health system as a set of functional components. Londono and Frenk [4] argued a system consists of four functions: financing, delivery, modulation and articulation. Applying this concept to health systems

financed through social insurance, they proposed a new organizational model to carry out these functions. Anne Mills [5] also conceptualized health systems as loose framework of actors and functions. The functions she identified are financing, regulation, resource allocation, and service provision. While these approaches help classify and analyze a health system by its internal functions, they do not make explicit what goals the functions aim to achieve, how the functions effectuate them, how the functions interrelate, or how variations in organizing the functions affect outcomes.

The World Health Organization's *World Health Report 2000* [6] defined health systems by the boundary of activities they encompass. Unlike the approaches discussed above, the majority of the *Report* focused on the performance (ultimate outcomes) of health systems and performance measurement. The *Report* described health system functions (stewardship, resource creation, service provision, and financing), emphasizing the stewardship role of the government. However, the *Report* did not adequately address the relationships between the key functions and health system performance. More importantly for policymakers, it does not explain why a particular system yields a given outcome, what features of that system contributed the most to producing the outcome, or how one could restructure the system to achieve a preferable outcome.

To investigate this why and how, health economists have largely applied economic theories of supply and demand to model and analyze actions in the various markets that comprise the health system [7], [8]. A health system can be conceptualized on at least two levels: macro and micro. The macro-level focus is on *overall dimensions* of health sector, the total size, shape, and functioning of the “elephant,” that is the health sector, while the micro-level explores behavior and dynamics of individual firms and households [9], [10]. Ideally, the aggregated behavior of individual households and firms predicted by microeconomic theory would explain macro-level phenomena. However, at least a dozen markets compose the health sector, and the interactions among them are not well understood or adequately studied. Consequently, microeconomic theory has offered little insight into or explanation for *macro-level* outcomes such as overall health status

[11]. Moreover, microeconomic theory has not been able to offer adequate explanations for major structural features that are common to most health systems and that influence macro-outcomes.

This paper's objective is to develop an analytical framework that models the *systemic* aspects of a health system, i.e. the major components of a health system that are related and can explain aggregate outcomes. Stated another way, it is a *causal model whose major components (i.e. explanatory variables) can largely account for observed outcomes (i.e. dependent variables)*. Such a model can assist us in understanding the major factors that may explain varied system outcomes, provide a framework to compare health systems and test hypotheses, and offer instruments for policymakers to manage their health systems' performance.

The paper represents the culmination of several years of research, initiated a decade ago [12], [13], [14], [15] and builds upon the work of other researchers. The paper is organized in four sections. The first section examines the fundamental principles used for modeling health systems. Applying these principles, we clarify and answer the question, "*what is a health system?*" Section II presents the final goals of a health system. The next section discusses the five fundamental structural components of a health system in some detail. The last section summarizes how this model can assist policymakers, researchers and the public engaged in the search to structure better health systems.

I. What is a Health System?

Health systems, like other socioeconomic systems, evolve in unique historic, cultural and political contexts. Nonetheless, every system is structured by state actions or non-actions to serve certain social purposes. The system exists and evolves to serve societal needs. Simply put, *a health system is a means to an end*. Applying a long-standing paradigm in industrial organization economics, we hypothesize that the structural components of the system affect the behavior of individuals and firms in that

system, and that their behavior and interactions determine the observed outcomes. Under this paradigm, a health system is a set of relationships in which the means (i.e. structural components) are causally connected to the ends (i.e. goals.) In this context, then, we have to analyze the goals and structural components of a health system.

What goals do nations want their health systems to achieve? A myriad of programmatic goals has been discussed in the literature. Every evaluation study of health programs specifies the goals by which the program will be assessed. However, goals are heterogeneous, depending on the purpose of a program. Some programs seek to increase average health status, some to maximize efficiency, some to prevent impoverishment, some to improve quality of service. They are not all ultimate goals. Some are intermediate outcomes or some pertain only to a selected disease or population.

At the *systemic* level, we must clarify what ultimate outcomes matter to a nation and distinguish them from intermediate outcomes. While the latter are important and can affect the final outcomes, they are only intermediary and partial results. **We examined multiple countries' health-related legislation, policy papers, and reports to identify the explicit and implicit goals of their health systems.** The goals thus identified are: improving health, financial risk protection, and public satisfaction.

As for the means, there are many possible structural variables that have some power to explain observed outcomes. How can we sort out which ones are essential and which ones are peripheral? We use three criteria. First, since our aim is to develop a model that is useful for policy analysis, we will examine and select only those structural variables that can be altered by policy. Because we are developing an ends-oriented model, we focus on the elements that can be used as policy instruments to achieve societal goals for the health sector. We exclude those variables that cannot be changed except in the long term, such as culture. Finally, taking advantage of many nation's policy "experiments" to improve their health system's outcomes, we identify plausible explanatory variables based on empirical observations. The key means, which we call

control knobs, include financing, payment, macro-organization of health care delivery, regulations and persuasion.

In sum, a health system, defined for policy purposes and economic research, is a set of relationships in which the primary variables are causally associated and linked with the outcomes. We limit the variables to those that can serve as policy levers. Using this set of criteria, we propose a new health system definition.

“A health system is defined by those principal casual components that can explain the system’s outcomes. These components can be utilized as policy instruments to alter the outcomes.”

We adopt the WHO’s description of the boundary of the health system as “all the activities whose primary purpose is to promote, restore, or maintain health.” [6].

II. GOALS

Health Status

What socioeconomic ends are served by health systems? Despite the fact that nations structure their health care systems very differently, most nations do share certain basic beliefs: one, good health is of intrinsic value to people; and two, certain health services are necessary to sustain life and to relieve intense suffering. Although some researchers have argued that health maximization should be considered the sole goal of a health system [16], there is now consensus that health systems have multiple purposes. We have identified two additional health systems goals common to most countries.

Financial Risk Protection

The first of these is financial risk protection. National health insurance systems explicitly places risk protection as a final goal. The earliest health insurance systems

such as the German *krankenkassen* began as a facet of national program to minimize the risk of absolute impoverishment among the working class due to disease, disability, and unemployment [17]. National Health Service systems implicitly offer risk protection by providing free (or nearly free) expensive ambulatory and hospital services. The British National Health Services can trace its roots to the Poor Law of 1911 [18]. The Beveridge Report, which provided the framework for the NHS, recommended the development of a social insurance scheme to provide a “minimum income needed for subsistence in all normal cases” [19].

Many countries include “affordability” as a policy objective of the health system. The affordability of a good is defined by the consumer’s ability to purchase it without excessive financial burden. Health care is characterized by uncertainty of high medical costs, hence affordability is determined by the extent of the insurance function of the health system. Therefore, countries’ “affordability” objective is more properly defined as the goal of attaining adequate financial risk protection for citizens.

Instead of risk protection, the *WHR* identified “fairness of financial contribution” as a health system goal [6]. Fairness of financial contribution measures the share of households’ non-food expenditure spent on health. It does not assess whether services are affordable to the poor or how well all citizens are protected against financial catastrophe. On the other hand, financial risk protection is precisely what concerns most countries. As a result, recent international research focuses on financial risk protection as a basic health system goal [20].

Public Satisfaction

It’s self evident that public satisfaction is a goal for political leaders and policymakers of democratic societies. Even leaders of authoritarian states have to satisfy the public in the long run. Economists often call this goal individual utility improvement [21]. Governments are increasingly cognizant of the fact that the stability of the health system is not assured without adequate public satisfaction. Blendon et al [22] concluded that public dissatisfaction with health system performance contributes to political

pressure for health system reform: dissatisfaction with the status quo is highly correlated with public opinion that the health care system requires fundamental change or complete overhaul.

Governments have also relied on opinion polls to guide its policy decisions. When the British National Health Services was debated in 1942, Beveridge stated:

“This desire is shown both by the established popularity of compulsory insurance, and by the phenomenal growth of voluntary insurance against sickness, against death and for endowment, and most recently for hospital treatment. It is shown in another way by the *strength of popular objection* to any kind of means test.” (emphasis added, [19])

More recently, UK explicitly undertook reforms to make services patient-centered and implemented plans to monitor patient attitudes with surveys and focus groups. (NHS, 2000). At the same time, private insurance providers have adopted patient satisfaction (and patient experience) as performance measures [23].

The *WHR* rejected satisfaction as a health system objective, arguing that satisfaction confounds expectations with accurate assessment of the present circumstances [24]. However, this component of expectation in public satisfaction is precisely what helps defines the goals toward which reform is oriented.

The role of equity

Equity is widely defined as a health system objective, often expressed in terms of “universal equal access to health care.” We consider it a principle be applied to the achievement of the three goals of health status, financial risk protection, and consumer satisfaction. In sum, there are two dimensions to each of the three goals: level and distribution. We can illustrate these declared goals in Fig. 1, noting that these objectives go beyond the usual concerns of economic analyses that tend to focus exclusively on efficiency and remain silent on equity [25].

Fig. 1 around here

The goals are not entirely independent of each other. Greater achievement in one goal may further another; likewise, poor performance in respect to a goal may limit ability to attain another. For example, Blendon et al. conclude that inadequate financial protection is one of the primary causes for public dissatisfaction with the American health care system [22].

All nations' common objective is to *achieve multiple goals with a given resource constraint*. Every nation must make difficult trade-offs when it wants to achieve multiple objectives with limited resources. A nation wrestles with two types of trade-offs: inter-sectoral and intra-sectoral. First, a nation has to make trade-offs between health-system goals (e.g. improving the health status of the population) and other economic, political and social goals (e.g. providing education for all children). Consequently, the *level* and *distribution* of health status, financial risk protection, and consumer satisfaction depend, in part, on a nation's economic resources. In common parlance, it depends on what is affordable.

The second type of trade-off takes place when a nation tries to achieve different goals *within* a health system. For example, on the margin a nation has to make trade-offs between health status and public satisfaction (e.g. no waiting lines.) But rarely do nations make these inherent trade-offs explicit. Historical processes and fundamental social values create implicit boundaries to trading off different objectives, limiting the range of available reform options. Health care systems in European nations, for example, are deeply rooted in egalitarian traditions. Policy proposals violating this basic foundation of solidarity have little overall appeal regardless of how much they would enhance efficiency [26]. On the other hand, the health care system of the USA is rooted in libertarian traditions. Compulsory health insurance to cover all Americans remains elusive after more than sixty years of public debate [27].

We often confuse intermediate outcomes with the ultimate goals we care about. Targeting health policies and programs to improve access, quality and/or efficiency are

important, but they are of derivative importance to the ultimate goals of a health system. We are interested in pursuing higher technical quality of health services because it has a positive effect on health status. Improving service quality of health services is desirable insofar as it affects patient satisfaction and health outcomes. Maximizing allocative efficiency enables improvements in health status and risk protection under budgetary constraints. Ultimately, a nation's success in attaining these intermediate outcomes should be assessed in terms the extent to which they contribute to the final outputs. Fig. 2 illustrates the relationship between means, some intermediate outcomes and final goals of a health system.

Fig. 2 around here

III Control Knobs (Means)

Many nations have tried different policy “experiments” to improve their health systems’ performance. These ‘natural experiments’ have tested different state and market actions [3], [26], [28], [29]. Analyzing these experiences indicates which structural components of a health care system impact each of the final goals. We identify five major components which states can modulate to affect ultimate outcomes. In the policy context, we term these components the “control knobs” of a health system [15]; each consists of several instruments with optional settings, as explained below.

A. FINANCING AND ITS INSTITUTIONAL ORGANIZATION

Financing refers to the way in which money is mobilized and how it is used. It is a major control knob that affects outcomes such as health status and its distribution, and risk protection. Financing consists of at least four principal instruments: financing methods, allocation of funds, rationing, and institutional arrangements for financing.

Financing methods: There are five financing methods. They include general revenue, social insurance, private insurance, community financing and out-of-pocket payment. The choice of the major methods of financing determines the *amount of funds*

available for health care, who controls the resources and who bears the financial burden.

Since numerous public programs compete for general revenue financing while social insurance relies on earmarked revenues from employers and employee paid premiums, a program financed by social insurance is likely to have more funds. In general revenue, social, and private insurance financing systems, the ministry of health, social security agency, or private insurance firms, respectively assume major control of the financial resources. Each agency allocates the funds differently – thereby altering the systemic outcomes – in response to its unique objectives, interest groups, and political or market constraints. Obviously, financial burdens fall on different groups of people when health care is financed by taxes or by patients pay directly out of pocket.

Funds allocation: Allocation of funds among prevention, different health services, medical training and capital investments determines the technical efficiency in the production of health outcomes. Fund allocation also crucially affects the level of financial risk protection. For example, when an insurance financing scheme excludes certain services from its coverage, patients’ financial risk protection is eliminated and they face 100% of the charges. When public facilities do not provide certain services free (or nearly free), then patients have to pay. Alterations in insurance coverage or in the supply of medical services affect patients’ access to and utilization of health services, which influence their health status and consumer satisfaction. Direct public funding for medical education, hospital construction, and medical research influences the quantity and type of medical services supplied.

Rationing: No nation, rich or poor, is able to fund every health service wanted by its population. At the minimum, a portion of health care has to be rationed. Health services can be rationed by price, waiting time, competency of providers, right of patients to choose physicians, availability of complementary goods such as drugs and surgical supplies, and friendliness of providers. Rationing is primarily accomplished through the financing control knob by deciding what services are funded, and how much to pay. The rationing method chosen has significant effects on equity in health status, patient

satisfaction and risk protection. For instance, rationing health care by price means the poor have less access than the rich, while rationing by waiting time disfavors the rich because their opportunity cost of time is generally higher. Of course, the rich can go outside to non-contracted providers for service and pay-out-of pocket.

Institutional arrangement for financing: Among a nation's options are (i) relying on public monopoly or competition to provide insurance, and (ii) centralizing or decentralizing public financing. Under social insurance a nation can either organize the insurance plan as a public monopoly or allow many for-profit and non-profit insurance plans to compete, thus altering administrative efficiency. More importantly, the extent of competition in financing determines the degree of adverse and risk selection in financing, which in turn affects risk pooling. All advanced economies have found it difficult to achieve equity goals and to ameliorate adverse and risk selection through a voluntary insurance system. Consequently, all advanced economies (other than the USA) rely on general revenue or on compulsory social insurance to finance health care.

Tax or social insurance premium financed programs can be centralized or decentralized to regions. Under decentralized financing arrangement, the relationship between the amount of taxes or premiums paid and the services is more immediate and readily observable, it is easier for voters in each locality to calculate costs and benefits. They will have more information with which to decide how much taxes they are willing to pay, and for what services. However, regions have different tax bases. The poor areas may not be able to finance adequate services unless the central government takes remedial action. If a system's financing is decentralized and no mechanism is put in place to redistribute between regions or risk groups, decentralization can decrease equity in health and financial risk protection.

Figure 3 depicts the relationship between financing and selected intermediate outcomes and final goals. As the figure shows, sometimes financing has a direct impact on final outcomes and other times financing impacts intermediate outcomes such as access and quality, which in turn affect health status and public satisfaction. International

experience tends to show that financing is the major determinant of the level and distribution of two final outcomes: health status and financial risk protection [28].

B. MACRO-ORGANIZATION FOR DELIVERY OF HEALTH CARE

Macro-organization refers to the broad structure used to organize health care provisions. It primarily affects how individual organizations are organized and managed, thus impacting efficiency, quality and availability of health services. There are four fundamental decisions regarding the macro-organization of provision: competition, decentralization, integration, and ownership.

Public monopoly vs. competition The most important decision is whether to rely on public monopoly (i.e. publicly-funded government facilities) or competition among public and private providers to provide health services. International experience demonstrates the limitations of public monopolies. In a public monopoly, politics often intrudes, diverting organizations from the pursuit of the general public interest [30], [31]. In addition, public monopolies often lack adequate external checks and balances. Over time, these monopolies may place their own staff's interests over their clients'.

Alternatively, a nation can use competition to organize health services providers. Serious market failures common in the health service market are well-documented. Avoiding these market failures and maintaining effective competition requires many prerequisites that are difficult, if not impossible to establish for most low- and lower-middle income nations [13]. In addition, a system of effective competition often entails large transaction cost such as those evidenced in the USA [32].

Recently, economic theorists have suggested that competition induced by government contracting for services should increase efficiency and organizations' responsiveness to patient demands [33]. The UK and Sweden have created internal markets to force publicly-owned hospitals to compete for patients [26]. However, empirical evidence shows mixed results on the ability of contracting and internal markets to significantly improve efficiency and quality of health services [34].

Decentralization: When a nation chooses to rely on a public monopoly to provide health care, it has to decide which level of government should be responsible and held accountable for managing performance—central, regional/state, or district. Some theorists suggest that public power, responsibility, and accountability should be delegated to the lowest level, where voters have most direct knowledge and information about public health services' efficiency and quality [35], [36]. Unfortunately, local governments often lack sufficient capacity and human resources to manage the public health services.

Vertical integration: The third major issue in macro-organization is how to integrate preventive, primary, secondary, and tertiary care services. Most common illnesses can be diagnosed and treated at the primary care level, but more complicated diseases may require specialists and/or inpatient services, and the most serious illnesses may require tertiary care. A nation has to decide whether health services will be provided by separate and independent clinics and hospitals or by integrated networks of providers with clear referral guidelines. This macro-organization decision influences quality and efficiency of health care. When health services are fragmented, laboratory and diagnostic tests often have to be duplicated at each level. More importantly, each level may not know what tests and treatments the patient has already received. Consequently, patients can suffer from gaps in services or treatment delays and errors.

Ownership: The fourth issue in macro-organization involves ownership of health facilities. Ownership determines to whom and for what an organization is held accountable. There are three types of ownership: public, private non-profit and for-profit. Each behaves somewhat differently [37], [38]. For-profit insurance companies or hospitals are responsible for producing profits for their owners. Thus, it is logical and expected that for-profit private insurance plans will avoid covering high-cost patients, and for-profit hospitals will deny services to those unable to pay. Public and non-profit institutions often have multiple and ambivalent objectives, such as maintaining financial solvency while serving community interests [37]. Since outcomes such as community

interests are hard to measure and monitor, public and non-profit institutions may experience greater administrative slack in their operations.

International experience shows that macro-organization decisions significantly impact the efficiency and quality of health services. They in turn affect health status and public satisfaction.

C. PAYMENTS (INCENTIVE STRUCTURE)

Payment refers to the methods by which money raised by financing is paid out to individuals and organizations. The payment modality is the principal control knob for establishing incentives in the provision of health services, acting like a gravitational force, to pull individuals and organizations in a certain direction without coercion. Appropriate incentives can have measurable positive effects on provision and use of health services. Recent reforms around the world have focused on establishing “correct” incentives to promote efficiency and quality, with an emphasis on implementing supply-side (rather than demand-side) incentives [39]. A payment system for health providers has two parts: first, the method of payment, and second, the amount of payment per unit. Payment method creates two different kinds of incentives for the patients and providers-- *financial reward and risk bearing*. Different payment methods shift financial risk to different players in the system. In structuring payment systems, we focus on the four key players in the demand and supply of health services: patients, health professionals, institutional providers, and pharmaceutical suppliers.

Incentives for Consumers: The price consumers have to pay influences the nature and quantity of services they will purchase. For ordinary goods, economic theory shows that efficiency can be enhanced when consumers are required to pay the marginal costs of the goods. However, health care is not an ordinary market good. Serious illnesses are uncertain and their treatment entails large health expenditures. Usually, 10% of the population accounts for 60% or more of a country’s total health care expenditures. Some type of insurance is generally desired to spread this risk of catastrophic illness.

Insurance, however, leads insured patients to demand more services, some of which may have little beneficial effect. To reduce this inefficiency resulting from insurance, a nation can require the patients to pay a share of health costs out-of-pocket. Unfortunately, the financial burden of cost sharing may prevent poor and low-income households from seeking necessary health care, thus creating inequitable financial burdens and disparities in health status.

Incentives for Suppliers: The incentive structure established for providers affects cost, efficiency and quality of health services. For ordinary commodities, nations usually allow prices to be set by a competitive market. Unfortunately, international evidence shows that in the health care market, providers possess strong monopolistic power; hence, the health provision market is not competitive [13], [40]. Unless governments (or organized purchasers) intervene, providers can charge high monopolistic prices and induce demand. We explain the incentive effects on four major categories of suppliers:

(i) ***Practitioners:*** The method by which practitioners are paid, and the amount of compensation received, influences what treatment modality practitioners will select how services will be produced, how many hours practitioners will work, and how many qualified people will enter the market to supply services. Physicians can be paid on the basis of fee-for-service, capitation, or salary. Each method creates different financial rewards and risks for physicians. Physicians paid on a fee-for-service basis bear little financial risk. Their income rises with the volume of services provided, creating an incentive to increase service provision and resulting in health expenditure inflation. On the other hand, capitation shifts financial risk to physicians, motivating them to minimize services and select healthier patients. Table 1 shows the incentives imbedded in various payment methods for practitioners and compares their potential impacts on efficiency, quantity of services and risk selection.

Table 1 around here

When a nation relies on both public and private sector provision, the relative wage rates paid by public and private sectors influences how physicians split their hours working

in public and private facilities. The relative wage rate may also determine whether physicians will encourage patients to pay under the table. Similarly, relative compensation paid to specialty versus primary care services affects the proportion of medical graduates entering specialty training [41].

(ii) *Hospitals*: Financial incentives constitute one of the most powerful levers with which to influence quality and efficiency of hospital services. A hospital organizes and manages its activities and staff differently – changing quality of care and technical efficiency -- depending on whether it receives a fixed budget, fee-for-service reimbursement, or case-based payment. These organizational decisions impact the quality and technical efficiency of hospital services.

Prior to 1997, each hospital in Germany negotiated a global budget, based on the expected number of hospital days to be provided. De facto, then, hospitals were paid on a per diem basis. This per-diem payment method created incentives for providers to increase length of stay. It's not surprising the mean length of stay in Germany is the highest among OECD nations [42]. In contrast, American hospitals are mostly paid on a per admission basis, adjusted for case-mix (i.e. the DRG payment method), with payment rates set prospectively. If a hospital can treat a patient at a lesser cost than the prospectively set payment rate, the hospital keeps the difference as a “profit.” With this incentive in place, mean length of stay in US hospitals has become the lowest in the world [42]. However, case based payment for inpatient hospital services may increase admission rate [43].

(iii) *Pharmaceuticals*: As the relative health care expenditures attributed to drugs increases, pharmaceutical companies have become a major health system supplier. Patents grant a pharmaceutical company a monopoly on a particular drug. Many countries found it necessary to set payment level to reduce monopolistic profits. For example, Germany first introduced reference pricing in 1989, in which a statistical formula distinguishes an average price for 3 tiers of drugs. The introduction of reference prices led to a drop in drug prices of 20.6% in the first half of 1993. While effective,

reference pricing does have loopholes—there was an increase in overall expenditures on drugs because of a switch to new products that were not covered under the reference pricing system [44], [45]

D. REGULATIONS

Regulation, in a narrow and clear sense, refers to the government’s use of coercive power to impose constraints on organizations and individuals. Regulatory instruments may include laws, decrees, orders, codes, administrative rules, and guidelines issued by governments and by non-governmental bodies, such as self-regulatory organizations, to whom governments have delegated regulatory power [46]. The use of incentives or persuasion (e.g. indoctrination) to affect organizational or individual behavior is not regulation. An effective regulation requires *good design and wording* as well as governmental *ability to implement and enforce* the regulation. There can be many failures in establishing and executing regulations. Serious regulatory failures can make the situation worse than if there had been no regulation in the first place. One key regulatory failure occurs when a regulatory agency is “captured” by its regulatees (i.e. those organizations the agency is supposed to regulate). Instead of advancing the public interest, the “captured” regulatory agency promotes regulated benefits.

In health systems, regulations are established for four major purposes: (a) to provide safety protection for the general population to improve health, (b) to set the rules of game for transactions and exchanges to improve efficiency and quality of health services, (c) to enhance social equity by assuring everyone has access to basic health care, and (d) to correct market failures to enhance efficiency and quality of health care and insurance products.

The nature of health care makes difficult to regulate health professionals. Nations often rely on self-regulation to assure better quality of care, curbing induced demand and billing abuses.

A complete discussion of the range of regulatory initiatives is beyond the scope of this paper. Therefore, we have organized the categories health with selected examples in Table 2. Those regulations for protecting public safety have a direct impact on the population's health status. International experience seems to show that regulation has a limited role in enhancing equity.

Table 2 around here

D. PERSUASION

The private sector and the government have another powerful means to achieve health system goals: influencing people's beliefs, expectations, lifestyles, and preferences through advertising, education, and information dissemination. Private commercial firms have long used advertising to inform the population and to sell their products. Our beliefs and preferences are shaped substantially by these advertisements [47]. Besides providing factual information, advertisements try to influence our tastes and preferences by appealing to our desires, fears, imaginations, and hopes. Symbols, hero figures, and role models are often used.

Governments also influence our beliefs, expectations, likes, and dislikes. They do so directly through education, jaw-boning by public officials, selective release of certain information while withholding others, and outright propaganda. While education, information, and indoctrination can be powerful instruments in altering people's beliefs and preferences, it usually takes a long time before people change their behavior. A good example is the tobacco campaign in the USA, which only showed a measurable impact on consumer preferences and behavior two decades after it began [48].

In the health sector, persuasion through an intermediary is also possible. One effective intermediary in influencing consumers' preferences is the medical profession. For example, manufacturers intensely market new technology and drugs to physicians.

Physicians in turn recommend these technologies and drugs to their patients, who rely upon them for professional advice and medical information. Under managed care in the USA, managed care plans scrutinize physicians' use of pharmaceutical products. In response, the pharmaceutical companies have turned to advertising directly to patients to influence their demand for new expensive drugs that may have limited marginal benefits [49].

Persuasion also has a powerful impact on the supply side. In many countries, governments organize and fund medical education, and influence medical ethics. Physicians' knowledge and beliefs affect their behaviors. A profession is distinguished from a trade guild by its social mission. A profession instills in its members beliefs about some noble purpose for which members should sacrifice their self-interests [50]. The dedication engendered by these professional beliefs is illustrated by the behaviors of physicians and midwives in Sri Lanka, who continue to perform their duties quite faithfully for public facilities despite low pay and poor working conditions. In short, availability, efficiency and quality of health care are greatly affected by medical ethics and beliefs.

C. Summary of Ends and Means

In Table 3, we illustrate the relationship between the structural components (i.e. control knobs) and outcomes. For example, while equity is largely affected by financing, efficiency is mostly affected by payment, and macro-organization of provision and financing. Although not explicit in Table 3, the extent to which societal goals are achieved also depends on the interactions among the control knobs. Often, the effectiveness of a particular knob requires the correct setting of another knob. For example, the effectiveness of using social insurance as the financing modality depends on the macro-organization of the delivery system. It is beyond the scope of this paper to discuss interactions among, and the "correct" combination of, the control knobs.

Table 3 around here

IV. Why it Matters How a Health System is Conceptualized and Defined?

In short, this paper develops an analytical model of health systems, focusing on their ultimate system goals and the major structural components that explains different systems' performances. The model provides a new paradigm for the policy and research communities to understand and analyze health systems and allows the derivation and testing of hypotheses. The model also offers policymakers and researchers a framework to foster systematic and clear thinking, preventing mistaken conflation of effects and causes.

Furthermore, like marco-economics, the model focuses on the systemic aspects rather than individual- or firm-level behaviors. Similarly, where macroeconomics concentrates on the aggregated outcomes and several key policy instruments such as budget balance, interest and exchange rates, and current account balances, this health system model concentrates on the final goals and five major instruments (control knobs) that can impact the performance. Policymakers can focus their attention on these control knobs.

This model also provides a framework to distinguish intermediate and final objectives, enhancing comparative analysis of health systems. The muddled debate in the USA argues we have the best health care system because we offer choice, but the effect of choice on the final goals never clarified [51] Other proponents of the American system argue that it has higher quality of services than other systems. While their claims may be true, these individuals have confused the intermediate outcome with final outcomes. The superior intermediate outcomes such as higher quality of services are limited to those who are well insured or rich, and their higher spending for better quality of medical services may have been realized at the expense of having many citizens uninsured, and less funding for disease prevention. As the final outcomes show, the health status and public satisfaction of US citizens compare poorly with other advanced economies [52].

Governments always have a health policy, whether active or passive. Non-policy simply means defaulting to a laissez-faire position. In that case, natural socioeconomic forces shape the health system. Patients purchase health care according to their ability and willingness to pay. Because of income differences in a society, the population's health status and risk protection will reflect the inequity in that society. Likewise, because of market failures, such as asymmetry of information and imperfect agency relationship, a monopolistic, high cost, provider-driven health services market will emerge. It's imperative for policymakers to understand the consequences of their action and non-action. This model of a health system as a means to an end offers policymakers a conceptual tool to assess and design those essential parts of a health system that they can alter to improve their countries' health system final outcomes.

References

- [1] Roemer MI. National Health Systems of the World, Vol. 2. Oxford: Oxford University Press, 1993.
- [2] Raffel M. Health Care and Reform in Industrialized Countries. University Park, Pennsylvania: Pennsylvania State University Press, 1997.
- [3] OECD. The Reform of Health Care: A Comparative Analysis of Seven OECD Countries. OECD: Health Policy Studies No. 2, 1992
- [4] Londono, JL, Frenk, J. Structured pluralism: towards an innovative model for health system reform in Latin America. Health Policy 1997; 41: 1-36.
- [5] Mills AJ, Ranson MK. The design of health systems. In: Merson MH, Black RE, Mills AJ, editors. International Public Health: Diseases, Programs, Systems, and Policies. Gaithersburg: Aspen Publishers, 2001.
- [6] World Health Organization. The World Health Report 2000: Health Systems: Improving Performance. Geneva: WHO, 2000.
- [7] Jack W. Principles of Health Economics for Developing Countries. Washington, D.C., The World Bank, 1999.
- [8] Feldstein PJ. Health Care Economics, Fourth Edition. Albany, N.Y: Delmar Publishers Inc, 1993.
- [9] Ackley G. Macroeconomic Theory. New York: Macmillan Company, 1961.
- [10] Berwick DM. A user's manual for the IOM's 'Quality Chasm' Report. Health Affairs 2002; 21(3): 80-90.
- [11] Gerdtham UG, Jonsson B. International Comparisons of Health Expenditure: Theory, Data and Econometric Analysis. In Culyer AJ, Newhouse JP, editors. Handbook of Health Economics. North Holland, 2000
- [12] Hsiao WC. Comparing health care systems: What lessons nations can learn from one another. Journal of Health Politics, Policy, and Law 1992;17(4): 613-636.
- [13] Hsiao WC. Abnormal Economics. Health Policy and Planning 1995;32:125-139.
- [14] Hsiao, WC. et al. Background Paper for Module II, Flagship Course. Washington, The World Bank. 1997
- [15] Roberts MJ, Hsiao WC, Berman P, Reich MR. Getting Health Reform Right. New York: Oxford University Press, 2003.
- [16] Murray CJ. Towards an analytical approach to health sector reform. Health Policy 1995;32(1-3):93-109.
- [17] Reichs Gesetzblatt. Gesetz betreffend die Krakenversicherung der Arbeiter. Germany, 1883.
- [18] Pater JE. The Making of the National Health Service. London: King Edward's Fund for London, 1981.
- [19] Beveridge WH. Social insurance and allied services, report. New York: The Macmillan Company, 1942.
- [20] Wagstaff A. Reflections on and Alternatives to WHO's Fairness of Financial Contribution Index. Health Economics 2002;11(2):103-15.

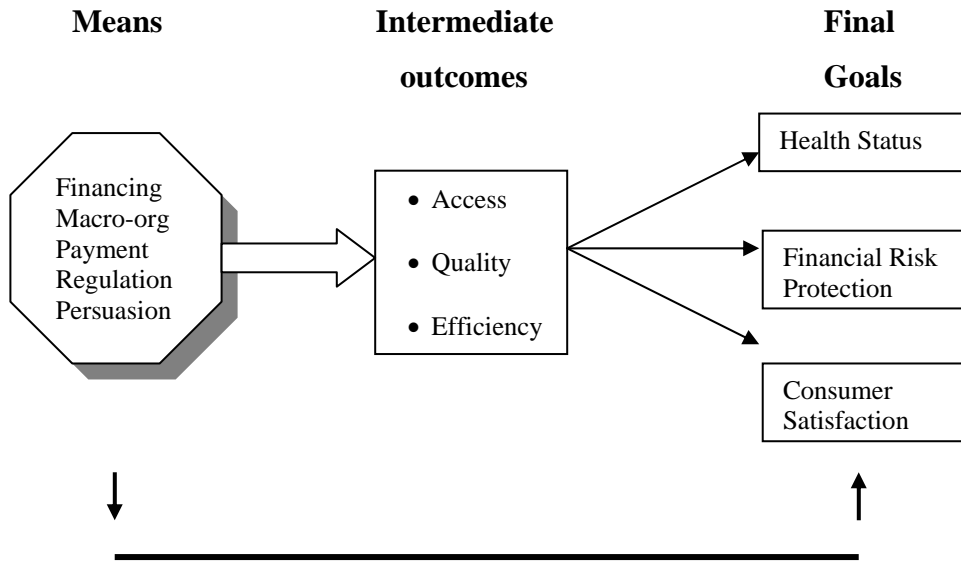
- [21] Hammer JS, Berman P. Ends and means in public health policy in developing countries. *Health Policy* 1995;32(1-3): 29-45.
- [22] Blendon RJ, Leitman R, Morrison I, Donelan K. Datawatch: Satisfaction with health systems in ten nations. *Health Affairs* 1990;185-192.
- [23] Cleary PD, Edgman-Levitan S. Health Care Quality. *Journal of the American Medical Association* 1997;278(19):1608.
- [24] Murray CJL, Kwabata K, Valentine N. People's experience versus people's expectations. *Health Affairs* 2001;20(3):21-4.
- [25] Okun AM. Equality and Efficiency: The Big Tradeoff. Washington D.C, Brookings Institute, 1975.
- [26] Saltman R, Figueres J, editors. *European Health Care Reform*. Copenhagen, World Health Organization, 1997.
- [27] Rushefsky ME, Patel K. *Politics, Power & Policy Making: The Case of Health Care Reform in the 1990s*. Armonk, New York: M.E. Sharpe, 1998.
- [28] Lu, J and Hsiao, WC. Does Universal Health Insurance Make Health Care Unaffordable? Lessons from Taiwan. *Health Affairs* 2003;22(3):77-88.
- [29] Hsiao WC, Dunn DL, Verrilli DK. Assessing the implementation of physician-payment reform. *New England Journal of Medicine* 1993;328:928-933.
- [30] Birdsall R. and Estelle James, "Efficiency and Equity in Social Spending: How and Why governments Mishave." In *Including the Poor*, eds. Michael Lipton and Jacques van der Gaag. New York: Oxford University Press for the World Bank.
- [31] Spulber N. *Redefining the State: Privatization and Welfare Reform in Industrial and Transitional Economies*. Cambridge: Cambridge University Press, 1997.
- [32] Woolhandler S, Himmelstein DU. The Deteriorating Administrative Efficiency of the US Health Care System. *New England Journal of Medicine*. 1991;324(18):1253-58.
- [33] Laffont JJ, Tirole J. *A Theory of Incentives in Procurement and Regulation*. Boston: MIT Press, 1993.
- [34] Mills A. Current policy issues in health care reform from an international perspective: The battle between bureaucrats and marketers. In: Nitayarumphong S. *Health Care Reform: At the Frontier of Research and Policy Decisions*. Nontaburi, Office of Health Care Reform, Ministry of Public Health: 19-45, 1997.
- [35] Mills AJ et al., editors. *Health System Decentralization: Concepts, Issues, and Country Experience*. Geneva: World Health Organization, 1990.
- [36] Mills AJ. Decentralisation and Accountability in the Health Sector from an International Perspective: What are the Choices? *Public Administration and Development* 1994;47:281-92.
- [37] Weisbrod BA, editor. *To Profit or Not To Profit: The Commercial Transformation of the Nonprofit Sector*. Cambridge: Cambridge University Press, 1998.
- [38] Keeler E, Melnick G, Zwanziger J. The Changing Effects of Competition on Non-Profit and For-Profit Hospital Pricing Behavior. *Journal of Health Economics* 1999;18:69-86.

- [39] Glied S. Managed Care. In: Culyer AJ, Newhouse JP, editors. Handbook of Health Economics. North Holland, 2000.
- [40] Kessel R. Price Discrimination in Medicine. Journal of Law and Economics 1958:1-19.
- [41] McIlrath S. Less for Surgeons, Fewer New Surgeons. AMA News; 1997 40(8):1.
- [42] Anderson GF, Poullier J. Health Spending, Access, and Outcomes: Trends in Industrialized Countries. Health Affairs 1999;18(3):178-92.
- [43] Hsiao, WC. and Daniel Dunn, "Impacts of DRG Payment on New Jersey Hospitals." Inquiry, Fall, 1987 24:212-20
- [44] Giuliani G, Selke G, Garattini L. The German experience in reference pricing. Health Policy 1998;44:73-85.
- [45] Ioannides-Demos LL, Ibrahim JE, et al. Reference-Based Pricing Schemes Effects on Pharmaceutical Expenditure, Resource Utilisation and Health Outcomes. PharmacoEconomics 2002; 20(9)
- [46] OECD. Regulatory Refrm:Overview & Proposed OECD Work Plan. (p. 40) Paris, OECD 1996a.
- [47] Galbraith JK. The New Industrial State. Houghton Mifflin Company: Boston, 1967.
- [48] Brandt A. The Rise & Fall of the Cigarette: A Cultural History of Smoking in the U.S. Basic Books, New York, 1998.
- [49] Findlay, SD. Direct-to-Consumer Promotion of Prescription Drugs: Economic Implications for Patients, Payers, and Providers. PharmacoEconomics, 2001;19(2) 109-119.
- [50] Friedson E. The Profession of Medicine, Dodd Mead, New York, 1970.
- [51] Enthoven, AC. Health Plan: The Only Practical Solution to the Soaring Cost of Medical Care, Reading, MA, Addison-Wesley, 1983.
- [52] OECD. Data Source for OECD Nations, 2003. Paris, OECD

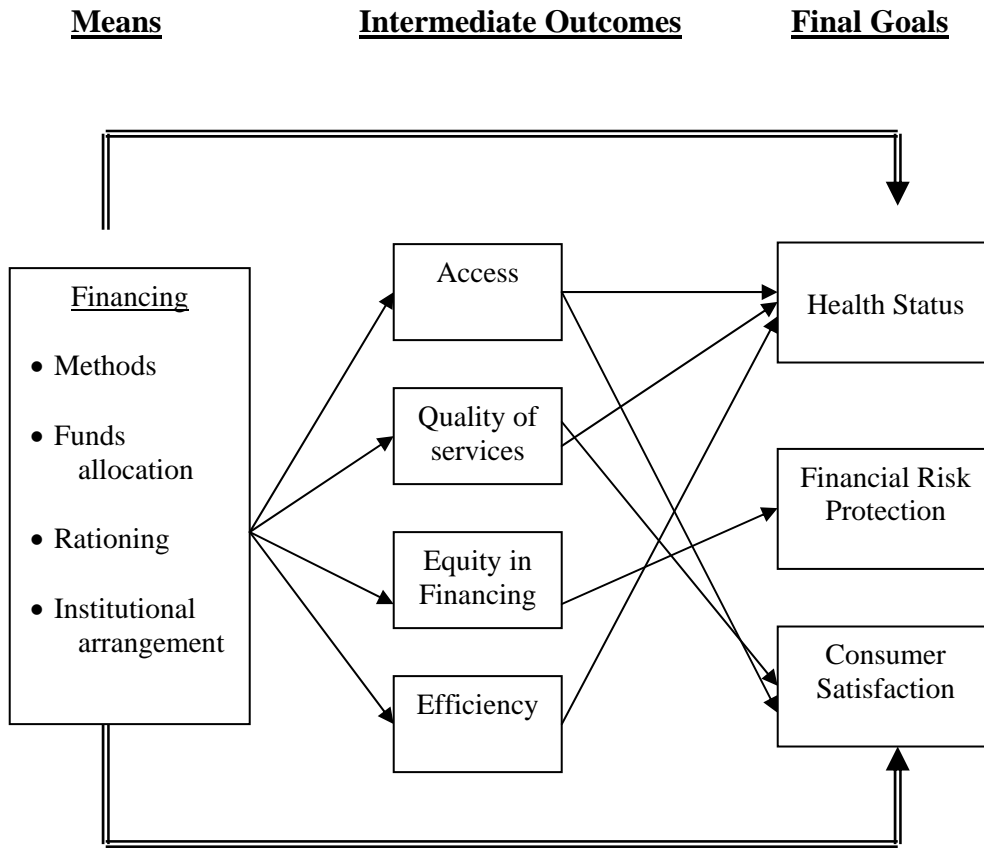
Hsiao, Fig. 1, Multiple Objectives of A Health System

	Health Status	Financial Risk Protection	Consumer Satisfaction
Average Level			
Equitable Distribution			

Hsiao, Fig. 2, Means, Intermediate and Final Ends of A Health System



Hsiao, Fig. 3, Relationships Between Financing Instruments and Goals



Hsiao, Table 1, Payment Mechanisms for Practitioners: Financial Risks and Incentives

Payment Mechanism	Basket of services paid for	Risk borne by:		Incentives to:			
		Payer (Insurer or employer of practitioner)	Practitioner	Increase number of patients	Decrease intensity of services per case	Increase reported illness severity	Select healthier patients
Fee for Service (FFS)	Each item of service and consultation	All risks	None	Yes	No	Yes	No
Salary	One week or one month work	All risks	None	No	N/A	No	No
Salary and Bonus	Bonus based on number of patients	Salary portion	Bonus portion	No	N/A	No	No
Capitation	All covered services for one person in a given period	Amount above "stop-loss" ceiling	Up to stop-loss ceiling	Yes	Yes	No	Yes

Hsiao, Table 2, Selected Examples of Regulations in Health Services by Category of Regulation

Category of Regulation	Examples
Public Safety	<ul style="list-style-type: none"> a. Standards for food hygiene, purity of drugs. b. Licensing of physicians, nurses and pharmacists. c. Accreditation of laboratories, hospitals. d. Labeling.
Rules of the Game	<ul style="list-style-type: none"> a. Advertisement restrictions. b. Negligence and malpractice liabilities. c. Property rights protection and patents. d. Solvency and bankruptcy laws for health service institutions. e. Patients' rights. f. Professional ethics.
Equity Promotion	<ul style="list-style-type: none"> a. Assignment of new medical graduates to serve in under-served areas. b. Patients' rights to emergency services.
Market Failures Correction 1. Manpower 2. Capital Investment 3. Information Disclosure 4. Monopoly 5. Quality 6. Price	<ul style="list-style-type: none"> a. Limits on training slots and "billing" numbers. b. Foreign medical school graduates entry restrictions. <hr/> <ul style="list-style-type: none"> a. Adoption/construction of new technology/facility approvals. <hr/> <ul style="list-style-type: none"> a. Conflicts of interest disclosure. b. Advertisement restrictions. <hr/> <ul style="list-style-type: none"> a. Anti-trust laws. <hr/> <ul style="list-style-type: none"> a. Practice guidelines. b. Standard quality report cards. <hr/> <ul style="list-style-type: none"> a. Price schedule for services. b. Reference prices for drugs.

Hsiao, Table 3, Relationship Between Structural Components and Societal Objectives

Control Knobs →	Financing	Macro-Organization of Provision	Payment	Regulation	Persuasion
Societal Objectives					
Final Goals:					
• Average level health status	X	X		X	X
• Av. level risk protection	X				
• Av. level consumer satisfaction	X	X	X	X	X
• Equity in health status	X			X	
• Equity in risk protection	X			X	
• Equity in consumer satisfaction	X			X	X
Intermediate Outcomes:					
• Equity in financing	X				
• Allocative efficiency	X	X	X	X	X
• Technical efficiency	X	X	X	X	X
• Quality of health services	X	X	X	X	X
• Management of total health expenditure	X		X	X	X