

Schreyögg, Jonas

Working Paper

The Taiwanese health care system under efficiency scrutiny

Diskussionspapier, No. 2004/17

Provided in Cooperation with:

Technische Universität Berlin, School of Economics and Management

Suggested Citation: Schreyögg, Jonas (2004) : The Taiwanese health care system under efficiency scrutiny, Diskussionspapier, No. 2004/17, Technische Universität Berlin, Fakultät Wirtschaft und Management, Berlin

This Version is available at:

<https://hdl.handle.net/10419/36419>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

The Taiwanese Health Care System under Efficiency Scrutiny¹

Jonas Schreyögg

Department of Health Care Management, Faculty of Economics and Management, Berlin University of Technology, Secr. EB2, Straße des 17. Juni 145, 10623 Berlin, Germany

E-mail: jonas.schreyoegg@tu-berlin.de

Phone: ++49-30-314-22627; Fax: ++49-30-314-28433

Zusammenfassung

Die vorliegende Arbeit untersucht Reformen des taiwanesischen Gesundheitssystems im Hinblick auf ökonomische Effizienz und erarbeitet Verbesserungsvorschläge. Zum tieferen Verständnis des Gesundheitssystems wird zunächst das ökonomische, politische und demographische Umfeld Taiwans dargestellt. Innerhalb der letzten Jahrzehnte hat sich Taiwan von einem Entwicklungsland zu einer starken ökonomischen Macht entwickelt. Politisch ist Taiwan eines der ersten asiatischen Länder, das eine Demokratie etabliert hat. Das Gesundheitssystem Taiwans hielt mit der rasanten ökonomischen Entwicklung des Landes jedoch nicht Schritt und glich bis 1995 eher dem eines Entwicklungslandes.

Zur Effizienzanalyse des Gesundheitssystems ist es zunächst notwendig, sich mit der theoretisch möglichen Gestaltung von Gesundheitssystemen allgemein und deren Anreizwirkungen auf die beteiligten Akteure auseinanderzusetzen. Dazu werden Gesundheitssysteme in Mittelaufbringung

¹ For most recent developments please see: Cheng T.M., Taiwan's new national health insurance program: genesis and experience so far, in: Health Affairs, May/June 2003; 22(3): 61-76; Lu R. J.-F. and Hsiao W.C., Does universal health insurance make health care unaffordable? Lessons from Taiwan, in: Health Affairs, May/June 2003; 22(3): 77-88.

(Finanzierung) und Mittelverwendung (Erstattung von Leistungen) gegliedert. Es werden zunächst grundlegende Modelle zur Finanzierung beschrieben mit ihren Vor- und Nachteilen. Anschließend wird bei der Darstellung von Methoden zur Erstattung von Gesundheitsleistungen im einzelnen auf die Erstattung von stationären, ambulanten und pharmazeutischen Leistungen eingegangen. Jede dieser Methoden entfaltet unterschiedliche Anreizwirkungen für die Akteure des Gesundheitswesens im Hinblick auf das Ziel einer bedarfsgerechten und kostengünstigen Gesundheitsversorgung bzw. einer optimalen Allokation von Gesundheitsleistungen.

Die Situation des Gesundheitssystems in Taiwan mit seinen Problemen vor 1995 wird kurz skizziert, um den Reformbedarf nachvollziehen zu können. Im Kern war fast die Hälfte der Bevölkerung, die zugleich die sozial schwächste Gruppierung darstellte, nicht krankenversichert. Es bestand ein ungleicher Zugang zum Versicherungsschutz, da bestimmte Gruppierungen Vergünstigungen in Anspruch nehmen konnten. Die Erstattungssysteme entfalteten falsche Anreize, die zu einer Kostenexplosion und Fehlallokation von Ressourcen führten.

Anschließend wird der Status quo im Jahr 2000, 5 Jahre nach den Reformen des Gesundheitssystems, beschrieben. Dabei wird im Hinblick auf eine optimale Allokation von Gesundheitsleistungen auf die positiven Effekte, aber auch auf die Schwachstellen des neuen Systems eingegangen. Es wurde eine einheitliche Pflichtversicherung eingeführt, die eine Absicherung der Krankheitsrisiken der gesamten Bevölkerung ermöglicht. Die Beiträge werden nach dem Bismarck-Modell der deutschen Krankenversicherung anteilig vom jeweiligen Einkommen des Versicherten ermittelt. Problematisch ist, daß das Defizit der Krankenkasse immer größer wird, was zum einen auf sehr geringe Beitragssätze und Zuzahlungen, zum anderen auf ineffiziente Erstattungssysteme zurückzuführen ist. Stationäre Leistungen werden zunehmend durch DRG's (Diagnosis related groups) erstattet. Diese entfalten positive Anreize auf Krankenhäuser Kosten zu senken. Sie sind allerdings erst für bestimmte Krankheitsfälle eingeführt. Ambulante Leistungen bilden den größten Ausgabenposten für die Krankenversicherung mit fast 50%. Dies ist auf hohe Kosten der Behandlung und sehr häufige Arztbesuche zurückzuführen. Patienten nehmen bei Bagatellkrankheiten häufig ärztliche Hilfe in Anspruch, begeben sich zudem nicht in Arztpraxen, sondern suchen direkt Universitätskliniken auf und verursachen so enorme Kosten. Kostenerparnisse durch die Einführung von

Kopfpauschalen für Diagnosen werden überlagert durch hohe Behandlungskosten, die immer noch einzeln abgerechnet werden. Die Registrierung von Pharmazeutika in Taiwan ist überdurchschnittlich aufwendig und langwierig im Vergleich mit anderen Ländern. Die Erstattung von Pharmazeutika wird erschwert durch Marktinterventionen aller Art, die somit Innovationen behindern.

Abschließend werden die zukünftigen Maßnahmen der taiwanesischen Regierung bewertet und eigene Vorschläge vorgestellt. Statt der Einführung von globalen Budgets, die für das Jahr 2001 geplant sind, sollte Taiwans Regierung eher versuchen, durch höhere Zuzahlungen und Beitragssätze die Finanzierungslücke zu schließen. Außerdem könnten die Kosten für ambulante Leistungen durch eine Etablierung eines Referenzsystems und eine Erweiterung der Kopfpauschalen auf die Behandlung enorm gesenkt werden. Alternative Finanzierungsformen sollten in Erwägung gezogen werden, um z.B. Konkurrenz auf dem Versicherungsmarkt zu ermöglichen.

Abstract

This thesis describes the status quo of the Taiwanese health care system in the year 2000, 5 years after the reforms, analyses the economic efficiency of single components of the new health care system and searches for possible solutions to solve uncovered problems. For a better understanding of the Taiwanese health care system, the economic, political and demographic environment is described first of all. Although the Taiwanese economy developed rapidly, the health care system was still looking like that of a underdeveloped country.

To analyze the efficiency of the Taiwanese health care system it is necessary to have a general look at the possible composition of health care systems and their incentives on the actors of the system. A health care system can be divided in finance and reimbursement. After presenting basic models of financing a health care system, different methods of reimbursing in-patient, out-patient and pharmaceutical services are described.

Before the reforms in 1995 the Taiwanese health care system was characterized by unequal access to health insurance leading to a proportion of 50% uninsured Taiwanese. Furthermore, all reimbursement systems provided disincentives for providers to act economically. The whole system led to a misallocation of resources.

Subsequently the situation of the health care system in the year 2000, 5 years after the reforms, is described and analyzed. A mandatory National Health Insurance has been introduced in order to provide comprehensive health insurance to everyone. Premiums are paid in proportion to the income of each insured person. The National Health Insurance has been running a deficit for some years, which is on the one hand due to very low premiums and co-payments and on the other hand a result of the inefficiency of reimbursement systems. In-patient services are more and more reimbursed by DRG's, which led to cost savings, but they are only introduced for certain cases. The non-DRG cases are still reimbursed via the fee-for-service payment leading to inefficient use of resources. Expenditures for out-patient services represent half of the whole total health care expenditures. This is primarily due to high costs of treatment and a very high frequency of visits. Patients frequently request out-patient services in case of minor diseases and usually wish to be treated by large teaching hospitals causing high costs of treatment. Although capitation payment has been introduced for diagnosis services costs of out-patient treatment still remain high. The procedure of registering pharmaceuticals in Taiwan is very complicated and can take up to 3 years. Due to many kinds of market intervention the reimbursement of pharmaceuticals in Taiwan is very difficult and possible innovations are distorted in this way.

Finally, future actions of the Taiwanese government are evaluated and own suggestions are revealed. Due to the high health insurance deficit the government announced to introduce global budgets in the year 2001. But instead of rationing health care it should rather try to increase rates for premiums and co-payments. In addition a working referral system and the introduction of capitation reimbursement for outpatient treatment could decrease costs and lead the system towards an optimal allocation of resources. Furthermore, it could be considered to change the financing system to a system with several competing insurance companies.

1. Introduction

During the last decades Taiwan has developed in a very short time from an underdeveloped country to a highly industrialized country. It is now one of the strongest economies in Asia and world leader in the IT sector. In a fast growing and changing environment the development the health care sector could not keep pace with that of other sectors. Taiwan's health care system was rather underdeveloped for a long time even compared with other countries which have not experienced a similar economic growth. For this reason the government has just recently reformed the whole health care system and introduced a National Health Insurance.

This thesis describes the status quo of the Taiwanese health care system in the year 2000, 5 years after the reforms, analyses the economic efficiency of single components of the new health care system and searches for possible solutions to solve uncovered problems.

First of all chapter 2 introduces Taiwan's political, economic and demographic environment. It contains some necessary background information to understand the composition of the health care system. After a short abstract in chapter 3, principal theoretical options of financing and reimbursing health care are discussed in chapter 4. The following chapter 5 describes the situation of the health care system before the reforms in 1995. Subsequently chapter 6 describes the situation after the reforms, points out its positive effects, but also lays bare the remaining problems. Finally chapter 7 presents possible solutions to solve the revealed problems and discusses actions planned by the Taiwanese government.

For the purpose of analyzing this system the author stayed in Taiwan for two months. During this stay several interviews have been conducted with physicians, pharmacists, patients, representatives of the pharmaceutical industry, officials of the Department of Health (Ministry of Health) and officials of the Bureau of National Health Insurance [BNHI].

2. Environment

A health care system is usually dependent on certain values, which are inherent in one's society. But these values can also vary over time, if the social environment of a society changes. In the following three sections the political, economic and demographic development of Taiwan will be described.

2.1 Political environment

Since the People's Republic of China was founded in 1949 Taiwan has been under a constant threat of invasion from its communist neighbor. Communist China still claims Taiwan as a part of China, a claim which is underlined and repeated every year by China's political leaders. This burden hangs like the sword of Damocles over Taiwan and can be felt in every aspect of life.

One effect of this tight relationship with Mainland China is the diplomatic isolation of Taiwan. As China seemed to become more powerful in the late eighties, nearly all countries broke off diplomatic relations with Taiwan to show their solidarity with China with the main purpose of sustaining economic relations from the mid and long term perspective. Although Taiwan is one of the most important trading partners and investors in Mainland China, it has not yet even been possible to agree upon direct transport links between the two countries. All flights from Taiwan to China have still to be made via Hong Kong. In addition, Taiwan is not a member of the United Nations, the WTO or the WHO, although this could change soon, since Taiwan's entry at least in the WTO and the WHO has recently been looking increasingly likely (The Economist, 2000, p. 27-28; Bruhlmann, P., 2000, p. 2-3).

Taiwan has been ruled since 1941 by the Kuomintang (KMT) Nationalist government, which maintained rather authoritarian rule until opposition parties became legal in 1987. In spite of that, the Kuomintang party had still considerable power, but started leading the country along a more democratic road. Since March 2000 the Democratic Progressive Party has taken over the government and established full democracy in Taiwan (Chen, M., 1995, p. 108).

Democracy is still a very important issue for Taiwanese people; evidence for this is the high participation of voters in elections. Nearly no other country reaches this rate, which at above 80% confirms popular willingness to participate in and to make use of democratic power. Thus, there is also fierce competition between the political parties since election results have recently been very close. This is also reflected by the decisions of the ruling parties, who do not dare to take unpopular decisions, and also reflected in the Health Insurance System (Schering Taiwan Ltd. Database, 2000).

2.2 Economic environment

Taiwan hardly suffered at all from the Asian economic crisis of 1997 and 1998. This is due to its very robust economy, built up over decades of high economic growth despite exclusion from the WTO in 1971. Taiwan has had the fourth fastest economic growth in any country of the world after the Second World War behind Japan, Germany and Korea. This economic growth has been achieved through low wages, the ability to innovate an established willingness to copy successful solutions. Taiwan has grown from an underdeveloped country in the fifties to an advanced “high tech” economy today. Taiwan’s economy, with a GDP per capita of around 13,248 US\$ in 1999, can now be compared with many European countries, for example Spain (US\$ 14,070) and Greece (US\$ 11,870) (Council for Economic Planning and Development, 2000, table 17-6).

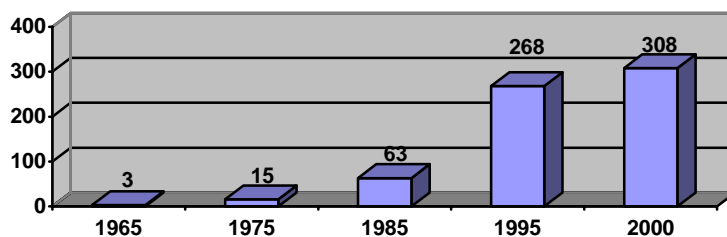


Figure 1: GDP Development in Taiwan (in bln US\$)² (Council for Economic Planning and Development, 2000, table 17-6)

² GDP for 2000 is estimated.

Taiwan's high trade surplus during the eighties primarily derived from massive exports, dominated by its computer industry, which has grown rapidly over the last 20 years and now accounts for 30% of the world's PC production. Another reason is the appreciation of Taiwan's currency, the New Taiwanese dollar, of about 75% between 1980 and 1995 against the US dollar. Since most of Taiwan's exports are traded in US dollars, the trade surplus rose enormously. But this is now a phenomenon of the past since Taiwan's imports increased sharply in the nineties. Pharmaceutical and chemical products currently constitute a major category in Taiwan's imports (Bruhlmann, P., 2000, p. 2-3).

The inflation rate has been kept stable for many years due to a stable currency and a cautious monetary policy. Since China is going to enter the WTO and WHO, Taiwan's entry now seems very likely as well. Entry could cause a significant boost to Taiwan's economy.

2.3 Demographic development

Taiwan's total population nearly doubled from 1960 to 1992, reaching 22 million, but the rate of growth has slowed down and population growth is estimated at 0.1% in 2000 (Directorate General of Budget, Accounting and Statistics, 1999, table 1-16).

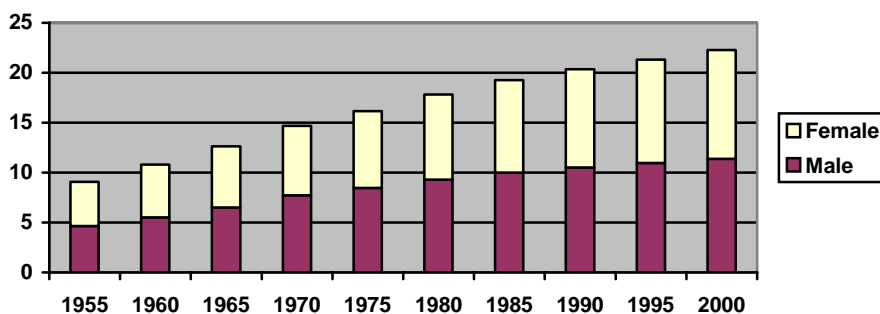


Figure 2: Population Development in Taiwan (in millions)³ (Directorate General of Budget, Accounting and Statistics, 1999, table 1-16)

³ Population for 2000 is estimated.

Thus the population has stopped increasing and some have even predicted it to shrink in the future. The Council of Economic Planning and Development in Taiwan (CEPD) projects a shrinking population by 2035. The major reason for this is, that Taiwan has, like other developed countries, a rapidly aging population. Fewer people are being born, while life expectancy is steadily increasing (see Appendix 1: Population by age group). Male life expectancy has increased from 62 years in 1961 to 72 years in 1999, while for females it has risen from 67 years in 1961 to 78 years in 2000 (Appendix 2: Life expectancy by sex). This significant jump for both sexes is also due to improved health care availability and better living conditions (Council for Economic Planning and Development, 2000, table 4-15).

3. Theoretical options of financing and reimbursing health care

Before focusing on Taiwan's health care system, general analytical models of financing and reimbursing health care have to be reflected in order to create a preference-adequate system of health care.

3.1 Methods of financing a health care system

There are various models in existence to finance a health care system. Five of these models, four commonly used ones and one theoretical best option, are now being describes below.

The first model can be described as the "Beveridge Model", also known as the "Rights Model", and can be seen as a socialist approach. It can be found in Canada, Great Britain and the Scandinavian countries. These societies regard health care as a general right for their citizens (Chen, M., 1995, pp. 99-100). Therefore, the government has an obligation to provide unlimited and free access to health care for everyone. The costs of this model are financed by general revenue, mainly taxes (Henke, K.-D., 1998, p. 7). Under this system government has full power to redistribute resources in order to create justice and equality. Government furthermore acts as a monopsonist power, expressing people's preferences in requesting all kinds of health care services. The major problem of the Beveridge model is its strong dependency on the economic development of the country. An economic downturn inevitably affects the financial stability of the system since taxes shrink in times of recession as a result of decreased incomes. As health

care costs outstrip taxes the health care system will most likely face a crisis ending up with rationing of health care, as practiced in Great Britain in the early nineties (Chen, M., 1995, pp. 100-101). But the rationing of health care could again cause pressure on incomes especially in the health care sector, and in this way deepen the recession and create a vicious circle. Another striking weakness of this model is the danger of moral hazard. It is believed that consumers of health care do not act as cost consciously if the state pays for them as if they have to pay for themselves or at least have to pay a co-payment (Marshall, J., 1976, pp. 880-890; Pauly, M., 1978, pp. 531-537).

In the second model, which can be characterized as the “Bismarck Model” or “Obligations Model”, all members of society are obliged to care for one another. It was developed in Germany when Bismarck introduced the first social insurance and is still used there as well as in many other countries around the world as part of a welfare state. Financing is based on the spirit of solidarity and is often subject to an income threshold, since employers and employees share the burden equally via payroll deductions. For this reason it is also called the pay-as-you-go approach (Henke, K.-D., 1998, p. 7). Each enrollee and his employer pay a certain premium according to the employee’s income to an insurance company. Provider and insurer are strictly organized as para-fiscal or self-regulating bodies, while the number of insurance companies differs between various embodied models. Competition among several insurance companies can be found in Germany, although some laws restrict it, e.g. the obligation to accept every applicant. Though this system is free of many problems others are faced with, there are still some weaknesses inherent. For instance it supports redistribution from the young working generation to the older section of the population, which is retired or no longer able to work. But in rapidly aging societies, e.g. European countries, this redistribution may not be affordable in the future, because the younger generation would have to contribute too much.

Another practiced model is the so-called “Group Model” or “Mura Model”, which can be found in Japan. This model is adopted by societies in which the “Muras” or groups serve as fundamental principles for social institutions. In these societies people pledge their allegiance to certain groups higher than their own individual identity. Thus, it stands as a categorical

imperative for residents to pay a certain premium to their group administration. The group then provides access to health care for its members. This model is similar to the “Bismarck Model”, but the most distinctive difference is that in this non-corporatist approach the society is divided into groups. As solidarity only applies to the group members and not to non-group members, issues of inequality are likely to arise (Chen, M., 1995, p. 101).

The “Individualistic Model”, the fourth model, is based on individualistic principles and can be found in the United States or many underdeveloped countries. The government has no right to determine the allocation of resources or even redistribute. It only provides a framework in which market mechanisms can work (Henke, K.-D., 1990, pp. 101-104). It primarily serves as a broker for the parties involved and does not contribute financially. Coverage is neither comprehensive nor universal and some countries do not even provide basic health care to their citizens unless they are insured. Therefore residents carry their own responsibility for health care and are not obliged to insure themselves. Premiums are risk-based, meaning that the future risk of disease or illness of every enrollee is assessed and his insurance premium is set accordingly. Deductibles as well as co-payments are further elements, which are compatible with this system as disincentives for moral hazard (Chen, M., 1995, p. 101). Unequal access is the most inherent problem of this system, since not everyone can afford to be insured under risk-based premiums, especially chronically ill and low-income class residents. Adverse selection or skimming, meaning insurers select only good risks or charge a relatively high premium for bad risks, are other weaknesses of the system. Altogether the individualistic model leaves a significant amount of the population without insurance coverage and therefore without access to health care.

The fifth model to be mentioned is a merely theoretical one. This model is based on the principles of subsidiarity and solidarity and therefore according to many experts is the one most compatible with the fundamental idea of social market economy. Residents are obliged to insure themselves privately in a system of several competing insurance companies, while premiums are calculated in a risk-based manner. Counter-selection as an inherent problem of a free insurance market is tackled by the legal obligation for insurers to contract respectively to accept all applicants. But in spite of this obligation, there is still the problem of asymmetric information between insurers and

insured, which is likely to result in skimming of “bad risks”. In this case, “bad risks” receive contributions, financed by public funds. Though such a system has not been implemented anywhere yet, it could be a good alternative to other current systems (Henke, K.-D., 1998, p. 6).

Model	Countries	Financing	Characteristics
Beveridge Model	Great Britain, Canada	Taxes	Dependent on economic situation; highly redistributing
Bismarck Model	Germany	Employers and employees via payroll deductions	Redistribution from young to old; demographic problems
Group Model	Japan	Employers and employees via payroll deductions	Society is divided into groups
Individualistic Model	USA	Risk-based premiums	Counter selection; many uninsured
Theoretically best Model	-	Risk-based premiums	Obligation to contract, therefore no counter-selection

Figure 3: Models of financing a health care system

3.2 Methods of reimbursing out-patient treatment

There are three commonly used reimbursement methods for out-patient treatment, with variable effects on the dimensions: access to health care, costs of treatment, quantity of treatments, quality of treatment and costs of health care administration. Access to health care describes the possibility for patients to receive the preferred amount of health care resources. Costs of treatment shows the intensity of costs caused by one treatment session of one patient. All methods provide different incentives to physicians to induce second and third treatment sessions for one case, which are sometimes not necessary. The dimension quantity of treatments therefore outlines the amount of sessions being used for one case. The quality of treatment is high if adequate treatment for quick recovery is provided. Finally costs of health care administration as fifth dimension indicates the intensity of costs caused by administrative activities to determine reimbursements.

Fee-for-service payment is probably the most popular of these methods. Under this system physicians are reimbursed according to every single unit of treatment. In some countries they can even set their own charges for each unit or item they use, although in Europe, Canada, Japan and other countries a trend can be recognized to standardize and regulate fees (Evans, R.G., 1990, pp. 101-128; Evans, R.G., 1992, pp. 739-762; Ikegami, N., 1992, pp. 689-713). Proponents of the fee-for-service approach state that it “cements the necessary bond between provider and patient” and hence provides the best conditions for effective treatment (McCarthy, C., 1981, p. 272-312). Although this method does not restrict the physician in terms of costs, it does not necessarily lead to treatment of high quality or effectiveness, since it strongly encourages physicians to make use of many units and expensive technology. Their income proportionally depends on the amount of units they use, and the more they use the higher their income. Patients cannot control the amount of units they receive for their treatment because of asymmetric availability of information between patient and physician. Patients simply have to trust their provider. On account of this asymmetry, physicians are able to create their own demand, also known as supplier induced demand, meaning they have the power to use and charge for as many units as they want to. As a further effect, primary care physicians might be reluctant to refer patients to specialists while on the other side the system encourages specialization since reimbursement fees are higher for complex procedures. All the effects described above might lead to excessive services, setting off rising health care (Schulenburg, J.-M., Graf v.d., 1992, pp. 120-126). An additional weakness to be mentioned is that reimbursement of every single unit causes huge administrative costs, which could be better spent on treatment.

Capitation as a second possibility of reimbursing out-patient care is not as preferred by physicians as fee-for-service payment. The major reason for this can be seen in the autonomy physicians enjoy within the fee-for-service system, not having to consider cost issues unlike within the capitation system. In a capitation system physicians receive a fixed amount for treatment of one patient regardless of how long the patient is being treated or which devices are being used (Glaser, W.A., 1986, pp. 481-490). Therefore, physicians have to carefully choose an appropriate method of treatment to save costs in order to have some profit as income. This method could also be seen as a partial delegation of risk from insurers to physicians, since now

not only the insurers but the physicians themselves have to review costs and efficiency of treatments. At the same time costs of administration decrease, because no units have to be reviewed and reimbursement procedures are easier. Capitation not only provides incentives for physicians to reduce costs of treatment, it furthermore encourages preventive medicine and continuity of care. In spite of the above-mentioned positive effects, this method cannot prevent supplier induced demand in terms of amount of patient visits, and the issue of quality is raised (Schulenburg, J.-M., Graf v.d., 1992, p. 127-129). Motivated by possible higher profit margins physicians could turn down quality of treatment and use outdated technology to save costs. To prevent this, guidelines have to be set up, legally obliging all physicians to treat patients in a defined way and to maintain certain standards of technology.

In order to stop supplier-induced demand completely the salary method could be used. Under this system physicians simply receive a fixed salary independent from costs of treatment but sometimes linked with bonus payments. Hence, there is no incentive for them to enhance the amount of patient visits or the units of treatment. Apart from this difference, just mentioned, between capitation and the salary method, the other positive effects are nearly identical. The salary system also raises the issue of quality, but based on a different line of argumentation. Physicians do not turn down the quality of treatment due to cost saving reasons. They rather lack extrinsic motivation, since neither a higher number of treated persons nor high quality related to frequently returning patients is being rewarded. This might lead to superficial attention and inadequate care by physicians and can only be tackled with guidelines (Glaser, W.A., 1986, p. 485; Lin, K., 1994, pp. 8-9).

Altogether fee-for-service reimbursement might be able to provide good access and quality of healthcare, but leads to disproportionately high costs due to large quantities and administrative complexity. In contrast, capitation and salary reimbursements are able to eliminate these threats, but always carry the risk of low quality treatment. Strengths and weaknesses of the described systems are summarized in figure 3 below.

Reimbursement Method	Access to health care	Quality of health care	Quantity of treatments	Costs of treatment	Costs of administrat.
Fee-for-service	++	+	--	--	--
Capitation	+	-	--	++	-
Fixed Salary	-	--	+	-	++

Figure 3: Out-patient Reimbursement Methods⁴

3.3 Methods of reimbursing in-patient treatment

For in-patient treatment reimbursement four methods of payment can be differentiated, also compared along the dimensions of access to health care, quality of treatment, quantity of treatments, costs of treatment and costs of administration.

Annual budgeting is a very simple method of reimbursement used in many industrialized countries. Government or insurance agencies negotiate with single hospitals on its expected costs of the coming year. Once a certain amount is approved, the hospital is expected to perform its work within the limits of this set budget (Glaser, W.A., 1986, p. 490; OECD 1987, p. 150). Negotiations between hospitals and reimbursing institutions take place every year, so that budgets can be amended accordingly. Due to their simplicity annual budgets keep costs of administration very low, although costs are highly dependent on the speed and complexity of negotiations. In addition, administrations are able to control the overall expenditure of each hospital in a very efficient way. One major problem of annual budgets can be seen in missing incentives for efficiency of treatment. Treating physicians and personnel do not feel closely affected during their daily operations by the “meta-goal” of the hospital to meet the budget. Under this system hospitals are not forced to establish cost accounting systems and thus they often do not know exactly how much is being spent on certain actions respective to treatments of cases. On the one hand, high quantities of treatment cannot be expected under this approach, since the hospital’s revenue or the physicians’ incomes are not dependent on the amount of

⁴ The content of this table is based on the assumptions of the author, from ++ (excellent) to -- (very poor).

treated cases. On the other hand this system does not necessarily promote high quality either, because the budget does set limitations on the amount spend on technical equipment, personnel, training of personnell etc. (Grupp, R., 1993, p. 4-10; Lin, K., 1994, pp. 9-10).

The method of day payment represents another possibility of in-patient reimbursement. Hospitals receive a certain amount per treated patient per day, which is either set by the insurer and the Government or negotiated for a certain period. Per day payment also has the advantage of administrative simplicity just like annual budgets, but does not provide the same overall expenditure control that annual budgets do. The number of days hospitals are able to charge is usually not restricted and therefore controlling the amount paid per day is the only possibility for paying institutions to limit the overall expenditure. This method also encourages hospitals to extend the length of stay per patient, thereby boosting revenues but lifting costs of reimbursement. If volume-control measures are absent, this system provides no incentives to limit a hospital's overall expenditure. As the number of days has a positive effect on the revenue of hospitals, they are also interested in enlarging the quantity of patients being treated. The direct effect of this is a shift from out-patient treatment to in-patient treatment, since hospitals are able to create supplier-induced demand, just like physicians in out-patient treatment, described in section 4.2. Treating patients in-patiently is more cost intensive than out-patiently, which leads to rising costs for the whole health care system. The quality of treatment under this system can be estimated to be similar to under the annual budget system, because increased lengths of stay does not necessarily lead to higher quality (Henke, K.-D. / Göppfarth, D., 2000, p. 13-15).

Fee-for-service or charge-based systems are also used for reimbursement of in-patient care and have already been described in section 4.2. They might be able to promote high quality, but contain incentives for excessive services leading to rising costs of treatment and increased quantities of treated cases.

The last method to be described is the DRG (diagnosis related groups) system. It has already been implemented in Australia, the United States, and other countries like Germany, are currently trying to implement it as well. It is based on a payment per treated case. Similar diagnosed cases

are grouped and reimbursed at the same price, which is fixed and sometimes amended. This method strongly encourages providers to think economically, since they want to maximize their profits (Günster, C., 2000, pp. 1-11). But with a fixed amount per DRG the only way of maximizing profits is to minimize costs. Thus hospitals try to economize their processes and to reduce the length of stay per patient, causing decreasing costs. Just like the capitation fee for reimbursement of out-patient treatment, the introduction of DRG's can be seen as delegation of cost responsibility from reimbursing institutions to providers. In spite of higher efficiency and accelerated processes, DRG's also provide incentives to increase quantities of treated cases via supplier-induced demand and to reduce quality or service intensity per case. For these reasons it is still unclear, whether DRG's reduce costs of the whole system or efficiency gains are simply neutralized by higher costs for double treatments due to low quality. For instance, in the American case some research findings prove, that lower growth of expenditures in the Medicare system was primarily achieved through reductions in quality of care and a slower rate of adopting new technology (Thorpe, K.E., 1992, pp. 227-230). Hospitals tend to specialize on certain DRG's, which may substantially reduce aggregate hospitalization costs if specializing hospitals are efficient. But if hospitals specialize by treating relatively healthier patients within each DRG, cost savings might be mitigated. This kind of counter-selection can only be avoided by strictly administrative monitoring (Dranove, D., 1987, pp. 417-427). Furthermore, there is evidence for the fact that many physicians try to get around DRG's. They just declare cases as multi-morbid, meaning one patient has more than one disease; therefore the case cannot be classified as a certain DRG. In this case reimbursement has to be done in a different way, e.g. fee-for-service payment, which is likely to be higher. Costs of administration tend to be higher than under annual budgets and per day payment, because it is very costly to categorize new diseases and reimburse every single case (Henke, K.-D. / Hesse, M., 1998, pp. 262-267).

These just mentioned reimbursement systems are either prospective with reimbursement according to anticipated expenditures or retrospective with reimbursement according to actual expenditures. As long as annual budgets are an obligation, they are prospective in nature, but as soon as costs of hospitals extend the budget and extra costs are reimbursed as well, they transform to retrospective reimbursement. Per day payment, DRG's and fee-for-service payment

are unequivocally prospective reimbursement methods while charge based payment has a retrospective character.

To sum up, annual budgets are administratively very efficient and provide low incentives to enlarge quantities, but do not force hospitals to work as efficiently as under DRG's, which instead have the weakness of attracting increases in quantities and reduction of quality. Per day payment might also lead to increased quantities, but there is less threat of low quality. Fee-for-service as a fourth possibility provides heavy incentive for excessive services, but maintains relatively high quality. The strengths and weaknesses of the different methods are displayed in figure 4 below.

Reimbursement Method	Access to health care	Quality of health care	Quantity of treatments	Costs of treatment	Costs of administ.
Annual Budgets	-	0	+	-	++
Per Day Payment	+	0	-	0	+
DRG's	+	-	-	++	-
Fee-for-service	++	+	--	--	--

Figure 4: In-patient Reimbursement Methods⁵

3.4 Registration for reimbursement of pharmaceuticals and market intervention to control reimbursement

Before a pharmaceutical product is reimbursed, in any country the first prerequisite is to register the product. Registration procedures and requirements differ from country to country, though some regions, for example Europe have standardized their procedures (Evers, P., 1995, p. 5). Drug companies have to decide in advance if they want to register their product as an OTC drug (Over-The-Counter drug) or as an ethnic drug (prescriptive drug). Prescriptive drugs have to be prescribed by a physician before being dispensed by a pharmacy, while OTC drugs can be bought

⁵ The content of this table is based on the assumptions of the author, from ++ (excellent) to -- (very poor);

without prescription. Both applications require different documents, but OTC requirements are stricter. Companies have to submit product dossiers, containing mainly clinical, pharmaceutical and pharmacological information. Most countries in addition require an inspection review, which means the factory the product is produced at is visited and analyzed by government officials to make sure everything complies with their regulations set by the reviewing country. Some countries require drug companies to conduct a clinical trial. Therefore, the applicants have to find a hospital which is suitable to test the drug and which finally certifies its efficacy and tolerance. After having reviewed all dossiers, health authorities either give their approval for registration of the product or not. When drugs are approved, the health authorities decide upon the issue of reimbursement. They basically decide whether the product can be reimbursed by insurance or not (Schering Taiwan Ltd. Database, 2000). The whole registration procedure is displayed in a simplified pattern in figure 5 below.

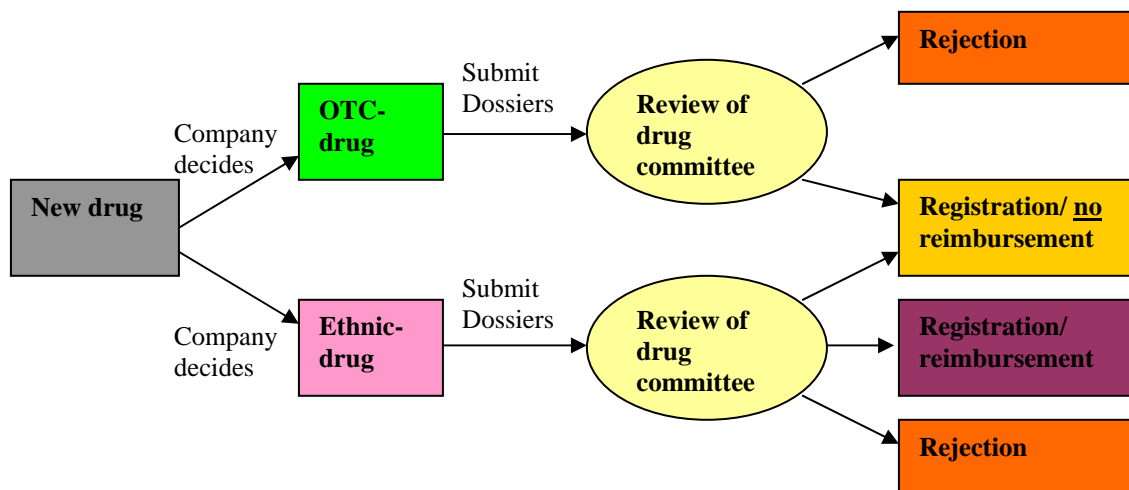


Figure 5: Registration Process

Once a product is registered health authorities still have the possibility to limit reimbursement by intervening in pharmaceutical markets. Apart from cost containment needs, there are several other reasons for market interventions, like concerns over monopolistic pricing and equal access.

dimensions used in figure 4 are based on the same definitions as figure 3 set in 4.2.

The three basic methods of market intervention, to be elaborated on later, are price controls, volume controls and spending controls. Each of these methods can be differentiated as supply or demand side controls. While supply-side controls limit drug companies' actions, demand-side controls represent interventions addressing physicians' or patients' demands. Both kinds of interventions have various positive as well as negative effects (Boston Consulting Group, 1999, chapter 2, pp. 4-6).

Price controls are primarily aimed at holding down unit costs and are most commonly used by nearly every country. Supply-side price controls can be imposed on single drugs, e.g. in France or Japan; on entire classes of drugs or groups of molecules, e.g. the class reference pricing in Germany; or they are based on prices in other countries; e.g. the cross-country reference pricing in Italy and the Netherlands (Boston Consulting Group, 1999, chapter 3, p. 2-5). In most studies these control methods had immediate cost cutting effects on the country's expenditure on pharmaceuticals, but they often turned out to be ineffective regarding the whole health care expenditure. This can, first of all, be due to substitution effects, as happened in Japan in 1993. In spite of the introduction of a price control system, driving down prices by more than 60 percent between 1980 and 1993, overall health care expenditure still rose 59 percent at the same time. Price cuts of old products led to high prices of new products and to sharp rises of prescription of drugs in general (Ikegami, N. / Ikeda, S. / Kawai, H., 1998, pp. 97-105). The reason for the failure can be seen in overly narrow-minded price controls, which addressed only certain products and did not consider possible substitutions. Another example gives evidence that reference pricing can be similarly ineffective. Germany introduced a reference pricing system in 1989, but public expenditure on pharmaceuticals rose even more than before (see appendix 4: Reference Pricing in Germany) (Schroeder, S., / Cantor, J., 1991, pp. 1099-1000; Henke, K.-D. / Murray, M. A. / Ade, C. G., 1994a, p. 258; Cambridge Pharma Consultancy, 1998, p. 2). Furthermore, reference pricing is based on the assumption that some drugs can in fact be compared with each other. New innovative drugs with slight but important differences in comparison with other drugs are not appreciated under this system. Possible innovations are distracted in this way (Boston Consulting Group 1999, chapter 3, pp. 2-5).

Next to supply-side controls, markets could also be controlled by demand-side controls. These are dominated by co-payments of patients for drugs and generic substitution of patented products. Early studies of Marshall and Pauly in the seventies have already revealed the positive effects of co-payments. Consumers are believed to act more cost-consciously when paying some part of the price of drugs they want to consume out of their own pockets (Marshall, J., 1976, pp. 880-890; Pauly, M., 1978, pp. 531-537). This method might prevent misallocation in terms of preventing waste of resources, but equal access e.g. for patients with low incomes has to be ensured. The aim of generic substitution is to offer consumers low price alternatives of a patented product with identical ingredients and therefore to hold down reimbursement costs. As long as there is sufficient patent protection for new products new innovations are not necessarily distorted by generic substitution (Schering Taiwan Ltd. Database, 2000).

During the nineties a trend could be followed, that health authorities overlaid volume limits on existing price controls with the aim of limiting unnecessary prescriptions and lowering costs of products. Marketing spending limits represent one kind of supply-side volume control. Health authorities limit the budget a drug company is allowed to spend on marketing its products. This method is supposed to reduce the volume of reimbursed pharmaceuticals, but this reallocation could also lead to a misallocation, since authorities do not know what the appropriate level of prescription is. In contrast to marketing spending limits, product volume caps restrict the volume of certain products directly and not via marketing budgets. This again raises the issue of misallocation, since authorities pretend to know the exact amount of drugs needed (Horn, S., et al., 1998, p. 1105).

As in the case of price controls, health authorities can also intervene on the demand side, limiting the volume that can be demanded. They could for example issue strict guidelines for prescribing and force physicians to follow them. One possibility of incorporating these guidelines is to create “positive lists” of products, which are reimbursed, and “negative lists” of products, which are not reimbursed as introduced in Germany in 1983 (Henke, K.-D. / Murray, M. A. / Ade, C. G., 1994a, p. 258). Guidelines may also contain information when certain drugs should be prescribed, including volume. Demand controls are just a shift of allocation responsibility, since

authorities decide upon prescription after the introduction of guidelines. But physicians might be better able to know the patients' needs due to their closer relationship. Therefore, this measure could lead to decreasing costs, but there is also a danger of misallocating resources. In addition, studies point out that in some cases decreases in volume of non-reimbursed products are displaced onto other reimbursed products and neutralize the cost saving (Boston Consulting Group, 1999, chapter 3, pp. 3-5; Horn. S., et al., 1998, p. 1105).

Instead of intervening at price or volume levels indirectly, some health authorities prefer to choose the direct way of intervening at the level of overall spending. Such spending controls can take the form of revenue or profit controls on the supply side. Authorities may negotiate revenue or profit limits with pharmaceutical companies on a bilateral basis, as practiced in France for instance. Therefore, companies can only sell a limited amount of drugs at a certain price. But the impact of these controls could firstly be a shortage of necessary drugs, which now cannot be sold anymore and hence set off a misallocation of resources. Furthermore, these spending controls could hinder companies from innovative product development. They are retrospectively orientated, so that companies are dependent on their past sales record, representing a basis for negotiations. Although a sudden unforeseeable breakthrough of one product could double a company's sales in a short time, it is not possible to realize it due to revenue controls. Spending controls may even endanger the motive of profit maximization, an unalterable element of capitalism, and thus slowing the development of a country's whole health care sector (Green, D., et al., 1997, p. 54-60).

Finally, demand side spending controls have to be mentioned as an increasing number of health authorities make use of them. There are different possibilities for limiting demand from an overall spending perspective. The most common way to implement this is to set up budgets for physicians; they can either regard the whole health care spending of one physician, with drugs being one part of it, or they only limit physicians' spending on drugs. Another possibility is to establish global budgets for spending on pharmaceuticals for the whole economy or at a regional level. Studies prove that budgets for pharmaceutical spending often lead to cost displacement onto other parts of the health care system, as could be seen in Germany. In 1993 the German

government introduced drug budgets for physicians in out-patient care to reduce costs of pharmaceutical spending (see Appendix 5: Drug Budgeting in Germany). Looking at the drug budget as a single component of the health care system, this measure led to intended cost savings of 5.4 bln. DM, but that was largely offset by increases in referrals to specialists and hospital admissions of 10% each caused a 5.1% rise in treatment costs (Schöffski, O., 1996, pp. 37-47; Henke, K.-D. / Murray, M. A. / Ade, C. G., 1994b, pp. 8-15). However, global budgets regarding all parts of health care expenditure as a way to prevent these substitution effects might endanger sufficient provision of health care. Altogether health authorities should rather concentrate on rationalizing than on rationing health care to maximize a society's welfare (Henke, K.-D., 2000a, p. 1-3).

Finally it is recommendable that governments weigh up the positive effects of cost savings and the negative effects of misallocation and loss of welfare. Some methods, like co-payments for example, are suitable for retaining market mechanisms in order to provide optimal allocation while at the same time contributing to cost containment. There is no general best solution for everyone, and health authorities of each country should consider the country's circumstances, and the possible effects of the measures taken and then decide on appropriate market intervention. The above-evaluated methods are summarized in figure 6 below.

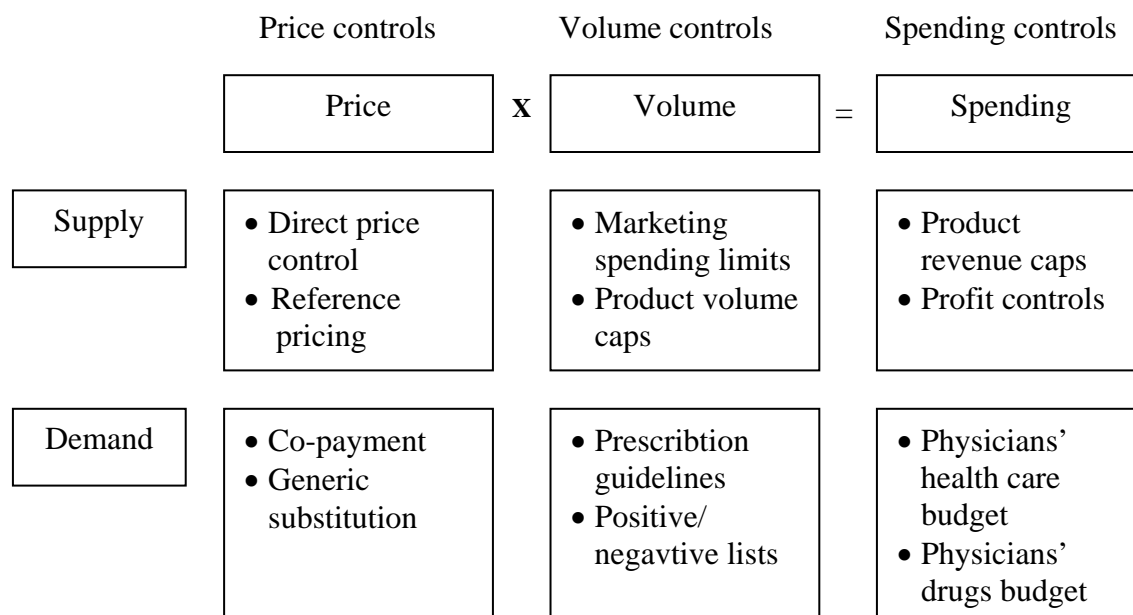


Figure 6: Methods of Market Intervention (Boston Consulting Group, 1999, chapter 2, p. 4)

4. The Taiwanese health care system before the reforms of 1995

The following two sections discuss the organization, finance mechanisms and reimbursement system of the health care system in Taiwan before reforms in 1995.

4.1 Organization and finance mechanism

Before 1995 the health care system, carried by the state, included three different and independent systems. The most comprehensive system was the Laborer's Insurance system, which insured most workers in the country, in total 37.1% of the population. Other insurance schemes were the Farmers' Health System and the Government Employees Scheme, each covering 8% of the population. Since private health insurance was still banned by the government, who feared counter-selection of risks, 47% of the population was not insured at all, as shown by figure 4 below (Bureau of National Health Insurance, 1999b, p. 3; Hsiao, W. / Lu, R. / Yaung, C.-L., 1990, pp. 29-32).

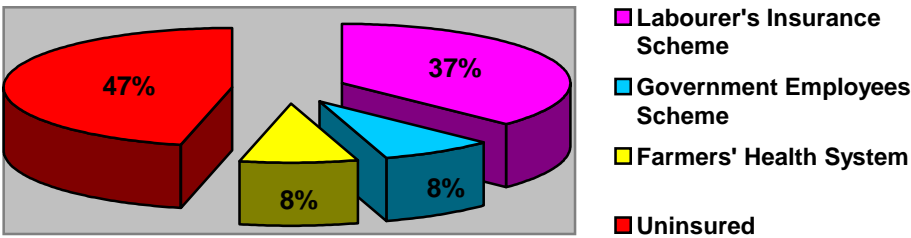


Figure 7: Proportion of Population Covered by Health Insurance Schemes or Uninsured before 1995 (Chiang, B. Y., 1993, p. 20)

These health schemes were originally created for weaker groups of the population, who could not afford to pay out-of-pocket for consumption of health care services and products. But with a closer look at the distribution of insured and uninsured, it becomes obvious that the actual weakest groups of the population, the youngest and the oldest were often not insured at all (see Appendix 3: Insured and Uninsured Population by the end of 1992). Insurance coverage was limited to groups of the population who either contributed to the economic development of the country (laborers) or sustained the political stability of the regime (public employees) (Lin, C.-H., 1996, p. 71). The system laid more emphasis on the “nation’s goals” than on the overall well being of the population (Chen, M., 1995, p. 109).

All systems were financed by a combination of premiums, payroll deductions and general revenue. But they had different premium rates and benefit structures, which raised the issue of equity and social solidarity, since premiums depended on the occupation and industry of each person. The whole construct could be characterized as a multiple-payer system with decentralized administration (Lin, K., 1994, pp. 7-8).

The patterns of this old health care system fitted to a developing country, which could not afford to have a comprehensive health care system providing equal access to health care for its population. In earlier times this system could have been more appropriate, since uninsured people, primarily young and old, were protected by their families according to Confucian

tradition. In a Confucian society the family is the most important entity, and the father as head of the family provides the financial means to support all the dependents. But today, as Confucian values in Taiwan are being at least partially replaced by the growing economic welfare, it seems important to provide sufficient health care to all individuals.

4.2 Reimbursement system

The reimbursement methods of the old insurance system differ substantially from the one introduced in 1995; therefore, it is important to know the old one to be able to understand why it has been changed to the current one.

There was no referral system for out-patient treatment, and the patients could choose between hospitals and clinics. Subsequently, most patients preferred hospitals even for routine care, because their equipment was more advanced. But since treatment at hospitals was much more cost intensive than at clinics for the same treatment, this led to a highly inefficient allocation of resources (Hsiao, W. / Lu, R. / Yaung, C.-L., 1990, pp. 19-25).

A voucher system was used to reimburse out-patient services, while every treatment was free of co-payment. Patients handed in a voucher for treatment and hospitals or clinics were reimbursed according to fees they claimed per voucher. This system can be characterized as fee-for-service payment. Every single claim was reviewed by the insurance organizations. But due to the high amount of claims (117 million claims in 1992) and the resulting explosion in administrative costs, a review-exempt-fee was set up in 1993. This enabled hospitals to claim an amount of up to US\$ 15 per voucher and clinics to claim up to US\$ 8 without being reviewed for every case by the insurers. At the same time it was much more difficult to get approval for a claim exceeding the review-exempted-fee. This caused the so-called “balance billing”, meaning doctors asked patients to pay an out-of-pocket fee to compensate for the shortfall between the real cost of treatment and the review-exempted fee or to cover any additional drugs. Balance billing could also be regarded as a hidden co-payment replacing the missing co-payment of the system, which had disastrous consequences for chronic patients and for patients with low incomes. But the actual calamity of this voucher system was, that no restrictions were set on the number of visits

per patient in one period. Physicians illegally demanded more than one voucher per treatment, which led to an “inflation” of vouchers and to the paradox of one patient apparently requesting treatment more than 370 times in a year (Lin, C.-H., 1996, pp. 75-76; Schering Taiwan Ltd. Database, 2000).

As mentioned above, out-patient treatment is reimbursed via the fee-for-service system. This way of reimbursement caused many negative effects. First of all, it provided an incentive for physicians to enhance their services as supplier induced demand, since they are fully reimbursed anyway. They asked their patients to return more frequently than was actually necessary from an objective point of view. But since medical services can be regarded as “trust-good” and patients have only very limited possibilities to prove the necessity of treatment, they usually followed the recommendations of physicians. This also included a limited commitment of physicians to refer patients to other institutions. Altogether fee-for-service reimbursement for out-patient payment led to a misallocation of services and increasing costs (Lin, K., 1994, pp. 8-9).

In-patient treatment was reimbursed by fee-for-service system and the retrospective charge-based system. Due to the variety of insurances there were no uniform payment rates. Every health care scheme set its own payment rate for different in-patient services creating different fee-for-service systems. The labor-insurance scheme for example used a point-payment system; therefore, hospitals were reimbursed according to the number of points they achieved for their activities. For uninsured self-paying patients hospitals determined the service charges by themselves as charge-based reimbursement. The main problem of this in-patient reimbursement method was that insurances had almost no information about the relationship between hospital charges and the actual costs, because most hospitals had no accounting systems and there was no formal audit of the hospitals’ financial books (Hsiao, W.C. /Lu, R., 1989, pp. 19-29). Fee-for-service systems as well as charge-based systems provided too few incentives to hospitals to use medical resources efficiently. Physicians were not forced to act cost-consciously; furthermore, they were able to use the system as an open checkbook.

The main issue in reimbursing pharmaceuticals was the missing separation between dispensation and prescription. As it is common in other Asian countries like Japan and Korea, physicians dispensed drugs for out-patient services by themselves immediately after treatment, making pharmacies redundant. OTC products were fully reimbursed, increasing the total cost of reimbursement enormously. All pharmaceuticals were reimbursed on a cost-plus basis by the three major insurance schemes. Insurances usually granted a price of 15-20% higher than the official cost of the goods. Research-based companies selling their products in Taiwan claimed that there was not enough patent protection (Lin, C.-H., 1996, p. 76).

5. The new health care system in Taiwan

In 1995 a new health care system was introduced in Taiwan with the aim of full population coverage. This chapter describes the current status of this system, the different elements it consists of and its problems.

5.1 Organization and general facts about the new health care system

To understand the decision processes in this health care system it is important to know how the institutions stand in relation to each other.

In the Republic of China the President conducts national affairs jointly with 5 highest powers of the central government, called the 5 Yuans. These are Executive Yuan, Legislative Yuan, Judicial Yuan, Examination Yuan and Control Yuan. The Executive Yuan is the highest body of the Republic and has executive power. The seven departments it consists of are the Central Bank of China, the Directorate-General of Budgeting, Accounting and Statistics, the Central Personnel Administration, the Government Information Office, the Environmental Protection Administration and finally the Department of Health. The Department of Health plans and supervises health programs throughout the whole country. It is supported by five subordinate agencies; these are the National Institute of Preventive Medicine, the National Laboratories of Foods and Drugs, the Narcotics Bureau, the National Quarantine Service and the Bureau of National Health Insurance. Programs decided by the Department of Health are then planned and

implemented at a regional level by the Municipal and Provincial Government, and finally carried out by health centers/ health stations in cities and health rooms in rural areas (see Appendix 6: Organization of Health Care in Taiwan). The Bureau of National Health Insurance is subordinate to the Department of Health as mentioned above and is responsible for funding the health care system (Department of Health of the Republic of China, 2000, chapter 1, pp. 5-6).

Health care in Taiwan has become more important over the last few decades, but total expenditure in % of GDP is still lower than in other countries. As shown in figure 5, Taiwan's health expenditures amounted to only 5.3% of GDP in 1997, which is very low compared to other industrialized countries like the USA or Germany (Lai, M., 1999, p. 2).

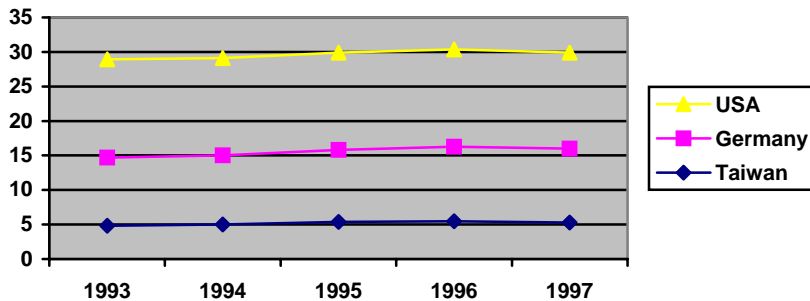


Figure 8: Health Care Expenditure in % of GDP (PriceWaterhouseCoopers & Rabobank International, 1999, chapter Taiwan; OECD, 1999, CD-version)

As a result of fast economic growth over the last few decades, health expenditures rose from year to year causing a significant increase in life expectancy in Taiwan. While health expenditures rose significantly, life expectancy increased by 20 years per person between 1950 and 1999 according to figure 9.

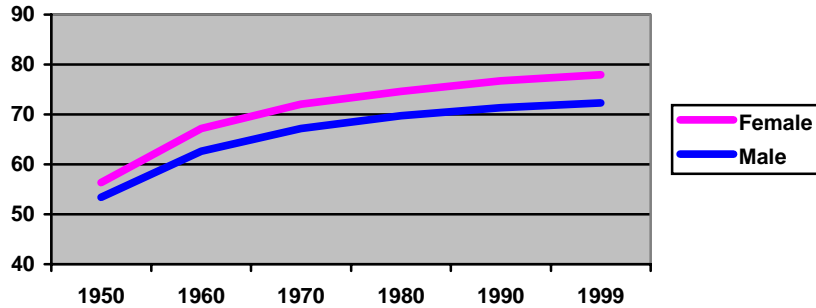


Figure 9: Development of Life Expectancy in Taiwan (Department of Health of the Republic of China, 2000, figure 1-2)

At the same time a growing number of people were covered by Health Insurance Schemes mainly due to rising per capita income. In 1956 with a per capita GDP of US\$ 3,296 only 4% of the population was covered by any health insurance scheme, while today, with a per capita GDP of US\$ 13,248, the National Health Insurance Scheme has nearly reached full coverage (see Appendix 7: Per capita GDP compared to health insurance coverage of population; Department of Health of the Republic of China, 2000, chapter 1, pp. 2-3).

In accordance with higher health care expenditures and insurance coverage the number of beds and practicing physicians has changed significantly. The number of beds per 10,000 people increased from 16.17 in 1971 to 52.7 in 1998 and the number of practicing physicians per 10,000 people has gone up from 5.29 in 1971 to 12.4 in 1998. In-patient health care in terms of provision of beds seems still underdeveloped, since for example Germany provides about 70 beds per 10,000 people (1998), but the number of physicians for out-patient care is only slightly lower than the 15.2 (1998) in Germany (see Appendix 8: Number of beds and physicians per 10,000 persons) (Department of Health of the Republic of China, 2000, table 1-3; Kassenärztliche Bundesvereinigung, 1999, tables C.4. + F.4.).

Compared to Germany a relatively high share of health insurance expenditure is spent on out-patient treatment. In Taiwan 46% is spent on out-patient care, while Germany only spends 26%. In total Taiwan's NHI expenditures of US\$ 8.4 bln are rather low compared to US\$ 102 bln of

the GKV in Germany considering its population is only 4 times bigger than Taiwan's population. (Bureau of National Health Insurance, 1999a, table 46; Kassenärztliche Bundesvereinigung, 1999, table G.3.).

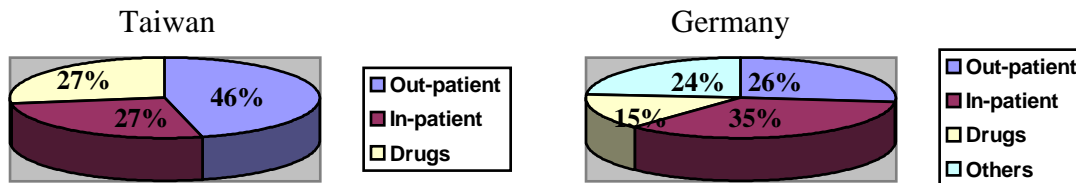


Figure 10: Share of Different Sections in the Total Health Insurance Expenditure⁶ (Bureau of National Health Insurance, 1999a, table 46; Kassenärztliche Bundesvereinigung, 1999, table G.3.

5.2 Finance mechanism

Since Taiwan intended to introduce a health insurance system with full population coverage an appropriate financing system had to be chosen. As described in chapter 5.1., there were several health insurance schemes. Therefore it could have been a possible approach to abandon the old insurance schemes and to create another insurance scheme covering those who had not yet been covered. This system would have been similar to the “Group Model”, in which everybody belongs to a certain group, here an health insurance scheme. One decisive advantage of this system would have been its easy and economical implementation, since some parts already existed. Another option was to take out the old insurance schemes and to establish a single program for everybody based on premiums similar to the “Bismarck Model”. This would have been much more cost intensive but with the advantage of providing equal conditions and access for everybody. The heterogeneous structure of the old insurance schemes did in fact not provide the same conditions for everybody on account of different reimbursement and premium systems.

⁶ Out-patient treatment includes dental services in the case of both countries; others for Germany include sick payment, which is not available in Taiwan, and therapeutic appliances/medical sundries, which are included in out-patient and in-patient treatment for Taiwan.

Therefore the government finally decided to introduce a single health care program called National Health Insurance, which, in contrast to the “Bismarck Model”, is state run and not self-regulated. Private health insurance is still not allowed (Chen, M., 1995, pp. 108-110).

In searching for the reason for this decision the values of Taiwanese society have to be considered. As mentioned in 5.1., Taiwanese society believes in Confucian values, in which the father cares for all family members. Using this as a metaphor at an aggregate level, the state can also be seen as a father caring for all members of society. This pattern conveys security, since it is familiar to everybody. Therefore, it was decided to attach the National Health Insurance to the Department of Health as a representative of the state. According to interviews, people think it has been the right decision to choose a state run insurance. They fear a self-regulated system with one or several insurances could be driven by profit maximization and therefore lead to inequality, not maximizing the welfare of society. Another reason for a single insurance is the fear of counter selection and subsequent market failure⁷.

One further core element of this system is to spread the financial burden equally among employers, employees and government to ensure financial independence. Employees contribute 30%, employers 60% and Government 10% (Department of Health of the Republic of China, 2000, p. 21). This again reveals the Confucian features of Taiwanese society; here the employer represents the father, who has to carry greater responsibility than the other “family members”, the employees. Hence employers have to pay more than employees; but from an economic point of view there is no difference to equal payment, e.g. 45% and 45%, since employers deduct the premium from the employee’s income anyway (Bureau of National Health Insurance [BNHI], 1999b, p. 15).

For employer and employee contributions premiums are based on the payroll related amount of the insured. The insured payroll related amount ranges from US\$ 480 up to US\$ 1,770 depending on the monthly income. Thus, employees pay the insured related amount x 4.25% x 30% x No. of

⁷ The author has conducted several interviews with government officials as well as with insurance enrollees. These statements are based on the answers given by the people questioned.

dependents. Employers pay the insured payroll related amount $\times 4.25\% \times 60\% \times (1 + 1.3)$. Employers pay an average of 1.3 persons in addition to the employees' premium as an average number of dependents to support the non-working population. Additionally, the government pays the average premium of the insured population $\times 10\% \times$ No. of dependents of each person. Compared to the former Labor Insurance, on average employees are now paying 177% more, while employers have to pay 77% more. There are some other regulations for certain groups like fishermen, farmers and low-income families. For example, low-income families and people older than 70 are insured without having to pay any premiums (Lin, C.-H., 1996, pp. 141-142; PriceWaterhouseCoopers & Rabobank International, 1999, chapter Taiwan; Bureau of National Health Insurance [BNHI], 1999b, p. 15).

National Health Insurance has mandatory status; everybody is obliged to enroll and to pay a certain premium for it. The purpose of this is on the one hand to avoid counter selection, as the insurance has to accept everybody, and on the other hand to prevent residents from being insured without paying any premium as free riders. Aborigines are the only exemptions from this regulation, since they sometimes have their own community health care system, but it is estimated that around 98% of the population are covered (Bureau of National Health Insurance [BNHI] 1999b, pp. 23-25; Bruhlmann, P., 2000, pp. 1-2; Lin, C.-H., 1996, pp. 154-157)

The Bureau of National Health Insurance reimburses only providers who have contracted with the NHI. Therefore, the contracted institutions are reviewed every year regarding standards set by the BNHI and have to apply for reimbursement. NHI then directly reimburses the approved institutions based on the benefits-in-kind principle⁸ according to each reimbursement system, as analyzed in 6.2-6.4. In addition to NHI reimbursement system, there are also certain co-payments depending on out-patient or in-patient treatment (6.2. and 6.3.) to prevent abuse of medical resources, but they are quite low (Bureau of National Health Insurance [BNHI], 1999b, p. 13).

⁸ The benefits-in-kind principle implies the insurance is reimbursing providers directly / Under the cost reimbursement principle as opposite, patients first pay providers out of their own pockets and are then reimbursed by insurances.

From its implementation in 1995 until now, growing expenditures have boosted the whole economy, but some major problems with this system have come to the fore. The major problem also dominating press reports about NHI is the growing deficit it has been faced with since 1998. As costs rise and demand soars NHI ran a significant deficit of US\$ 0.87 bln in 1999 (Rabobank International, 1999, pp. 18-20; Bureau of National Health Insurance [BNHI], 1999a, table 16).

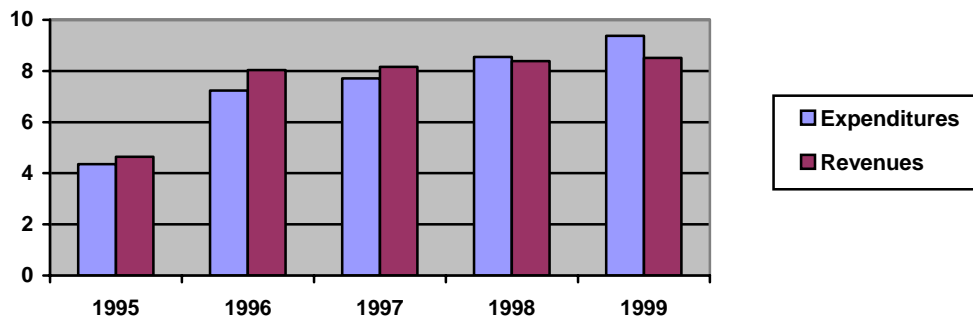


Figure 11: Financial Status of the Bureau of National Health Insurance (Cash basis/ in bln US\$) (Bureau of National Health Insurance [BNHI], 1999a, table 16)

There are several reasons for this development. On the one hand expenditures are rising steadily mainly due to weaknesses in reimbursement systems, but also because of low co-payments for in-patient and out-patient treatment (specified in 6.2.-6.4.). Thus in-patient and out-patient claims are much too high. On the other hand revenues are decreasing on account of several reasons; a few of them will be mentioned as follows.

Firstly, premiums are paid to municipal or provincial governments in order to transfer them to the NHI. But in fact there is a conflict of interest between municipal/provincial and state government and therefore premiums are sometimes not transferred. Municipal/provincial governments argued they need financial resources to improve infrastructure and for other projects. Hence they did not submit all received premiums to the BNHI. Figure 9 shows shares of outstanding receivables by source of governments in 1999. This clearly lays bare the fact that municipal and provincial

governments are mainly responsible for the government related total outstanding receivables of US\$ 0.44 bln.⁹.

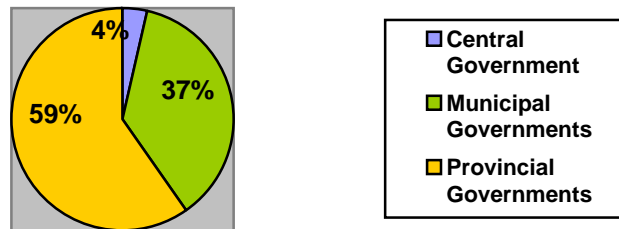


Figure 12: Outstanding Receivables of Government Contributions in 1999¹⁰ (Bureau of National Health Insurance [BNHI], 1999a, table 15)

Secondly, premiums are very low. The current premium payment is only 4.25% of the income, although the National Health Insurance Act, which is the legal basis for the NHI, allows an enhancement of premium of up to 6% (Bureau of National Health Insurance [BNHI], 1999a, pp. 23-25).

Thirdly, co-payment is very low. Co-payment for out-patient as well as in-patient treatment has a more symbolic character, since it has the value of a cheap meal.

The aging population is another reason for decreasing revenues (see 3.3.). As Taiwan's population becomes steadily older the number of people who are older than 70 and hence free of premium payment is growing yearly (also see Appendix 1). Since the government does not pay premiums for them to the BNHI, they are an additional burden to the system.

As an effect of decreasing revenues a shift from employees' and employers' contributions to government contribution can be viewed. Figure 10 points out that the government contribution

⁹ This information has been generated through interviews with NHI officials.

¹⁰ Municipal governments include Taipei and Kaohsiung City/ Provincial government includes Taiwan and Fukien Province Governments.

rose by 10% while the employers' and employees' contributions decreased by around 5% each between 1995 and 1999. This was caused by additional government subsidies to support the system (Bureau of National Health Insurance [BNHI], 1999a, pp. 15-17). If this development continues, Taiwan's insurance system is likely to move towards a tax-financed system like the "Beveridge Model".

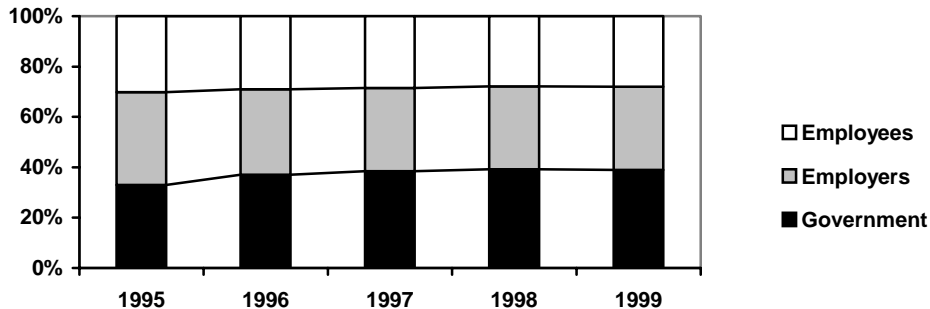


Figure 13: Shift from Employees' and Employers' Contributions to Government Contributions¹¹ (Bureau of National Health Insurance [BNHI], 1999a, table 14)

5.3 Reimbursing out-patient treatment

In Taiwan in-patient and out-patient care are very much integrated. Hospitals usually provide large out-patient units for secondary care treatment. Patients are supposed to go to primary health care clinics first and are then referred to hospital out-patient treatment units. There are four different possibilities for out-patient treatment: clinics, district hospitals, regional hospitals and medical centers (teaching hospitals). Clinics are the smallest treatment unit and 97% of them are run privately while hospitals can be as big as 2,000 beds in the case of medical centers, with 88% run privately. According to the referral system, introduced in 1995, every patient can be referred step by step from clinics to medical centers. But patients are not obliged to follow the referral system; they are free to go straight to hospital out-patient care units, called OPD's (out-patient departments) (Lin, K., 1994, p. 8-9; PriceWaterhouseCoopers & Rabobank International, 1999, chapter Taiwan).

¹¹ Figures are on an accrual basis.

Under the new system diagnosis services are reimbursed by capitation payment. This method aims to simplify reimbursement procedures and to prevent excessive services like those provided under the fee-for-service reimbursement in the old system. Capitations depend on the status of the institution. While all kinds of hospitals receive a fixed amount of US\$ 6.4 for every patient, clinics are reimbursed regressively to prevent supplier-induced demand. For up to 30 patients per day they receive a capitation of US\$ 7, for 30-50 patients per day they get US\$ 5.75 and if they have more than 50 patients, they only receive US\$ 3.85. The background for this regressive reimbursement for clinics is that in contrast to hospitals the utilization of capacities is often very low. Therefore, supplier-induced demand seems much more likely for clinics than for hospitals, which usually have their capacities fully utilized (Schering Taiwan Ltd. Database, 2000). Apart from reimbursement of diagnosis services, which represents 30% of the total out-patient expenditure, consultation, treatment and medical supply are further reimbursed by fee-for-service payment.

Services and medical expenses are reimbursed via the insurance card. Every insurance member receives an insurance card, which can be used six times for out-patient treatment. If one person has used it six times, he or she has to apply for a new one. The application is easy, but is supposed to prevent misuse of resources. After the fifth card further reimbursements of the insured are reviewed by NHI (Department of Health of the Republic of China, 2000, p. 21).

Out-patient treatment can be differentiated into the three main segments of dentistry, Chinese medicine and other out-patient services. Out-patient reimbursement is equal for all kinds of treatment, but co-payments depend on the segment and on the level of service provider. For dentistry and Chinese medicine co-payments are charged at a flat rate of US\$ 1.6 for every level of service provider. Other out-patient services have progressive co-payments of US\$ 1.6 for clinics and district hospitals, US\$ 3.2 per regional hospitals and US\$ 4.8 for medical centers. This progressive co-payment was introduced to reduce the incentive for patients to go straight to the medical centers. Empirical data on the former system showed, that uninsured patients were more likely to follow the referral system. They acted more cost-consciously, since they had to

pay “out of their own pockets”. Thus the BNHI believed co-payments would have a similar effect on the behavior of patients (Bureau of National Health Insurance [BNHI], 1999b, p. 13).

This new partial capitation system surely provides more incentive to be cost-conscious than the former pure fee-for-service system, but it has still not led to cost efficient treatment, since the actual treatment is still reimbursed via fee-for-service system. Costs of treatment respective to market prices for treatment as well as number of visits respective to volume are much too high in Taiwan resulting in excessive overall out-patient spending. The average Taiwanese requests 15.5 out-patient visits per year compared to 10.5 visits per person in Germany 5 in the USA and 2.8 in Sweden. The frequency of visits is already the highest in the world and is still increasing every year, as shown in figure 11 (Bruhlmann, P., 2000, p. 3).

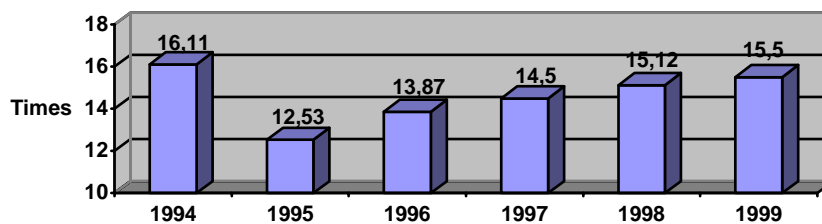


Figure 14: Frequency of Out-patient Visits (Bureau of National Health Insurance [BNHI], 1999d, p. 29)

There are several reasons for this high and still increasing frequency of visits. First of all Taiwanese very much believe in “doctors” services and physicians enjoy a very high social status, e.g. perhaps even more than in Germany during the 70’s. Patients request out-patient services even for minor illnesses like coughs and colds or flu instead of medicating themselves with OTC products. This might be due to tropical or other severe illnesses, which still occurred about 20-30 years ago in Taiwan and started with similar symptoms to flu or cough and cold, e.g. Malaria, but are very rare today (see Appendix 9: Changes in Ten leading Causes of Death). The older generation especially is influenced by experiences with these kinds of illnesses. Minor illnesses are estimated to be the reason for about 30% of visits for out-patient treatment. Apart from that, there is very little incentive for self-medication, since co-payments are very low. As

US\$ 1.6 co-payment for out-patient treatment is for example even cheaper than buying a box of aspirin tablets over the counter. Since drugs up to US\$ 3.2 are even included in the co-payment for out-patient treatment, there is no incentive for patients to buy OTC's. Therefore, even government officials admitted that the introduction of co-payments for out-patient treatment had no effect on the behavior of residents¹² (Department of Health of the Republic of China, 2000, p. 13).

Another reason for frequent visits is the limitation in prescribing drugs for clinics to 3 days. For only 3 days clinic-physicians do not have to specify which products they prescribe. If they want to prescribe drugs for more than 3 days, they have to apply for permission and specify which product is chosen. Applications can be rather unprofitable for clinics, because for a three-day prescription they receive a standard fee of US\$ 3.2. In case they prescribe drugs with lower costs, they have the difference as profit, but since they have to specify the products on application there is no extra income. As physicians would rather want to save time and earn extra income they prescribe drugs for only 3 days, increasing the frequency of visits. This can also be regarded as a kind of supplier-induced demand with the motive of earning extra income. The classic motive of supplier-induced demand is also widespread in Taiwan. Hospitals and clinics try to enhance demand for their services and recommend patients to return soon. As mentioned above, Taiwanese very much believe and trust in physicians and hence they mostly follow recommendations (Schering Taiwan Ltd. Database, 2000).

Apart from high frequency (volume), costs of treatment per person are also too high. A visit of one person including medical treatment costs in average US\$ 19.65 (1999), which is very high considering the 30% of minor illnesses. The average costs of treatment have steadily increased since 1995 (see figure 15).

¹² This information has been generated through interviews with NHI officials.

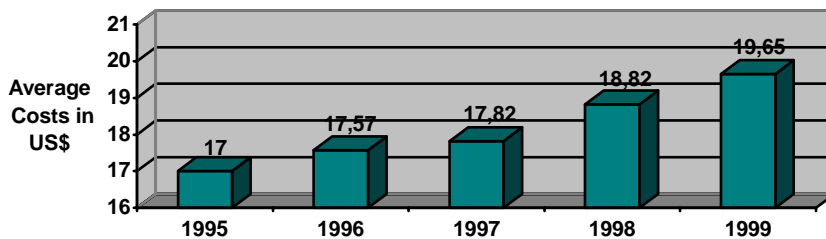


Figure 15: Development of Average Costs of Out-patient Treatment (Bureau of National Health Insurance [BNHI], 1999a, table 46)

This is primarily due to the failure of the referral system, since it is voluntary and residents do not have to follow it. Most residents prefer to go straight to hospitals, causing higher costs of treatment, consultation fees and medical expenses, instead of being referred from clinics. Hospitals are able to prescribe unlimited medication, while clinics have to follow the standardized fee of US\$ 3.2 for three days. Although in hospitals there are long waiting times for receiving out-patient treatment, people prefer to wait than to go to clinics. One reason is the Taiwanese belief in “big names”, which may have resulted from authoritarian education under the Kuomintang. Physicians in hospitals are usually better educated and supposed to be more skilled. Furthermore, as stated above Taiwanese are still afraid of severe diseases, though they occur rarely, and thus hospital physicians are able to give greater assurance of precise diagnosis. In addition the equipment in hospitals is more advanced than in clinics. Finally standardized fees for clinics regarding prescription of drugs has set off wrong incentives. Clinics on the one hand keep costs low by prescribing generics, but on the other hand patients tend to prefer hospitals which are able to prescribe branded products further increasing the total cost of out-patient treatment (Bureau of National Health Insurance [BNHI], 1999b, pp. 13-15)¹³.

In Taiwan prescription and dispensation of drugs is not completely separated. Since 1995 physicians have no longer been allowed to dispense drugs by themselves after treatment. They can now only prescribe medication. This action was supposed to prevent physicians from earning

¹³ Information about patient behavior regarding the referral system was gleaned from interviews with physicians in hospitals and clinics as well as with patients.

additional income from dispensation of drugs, but it failed. Clinics and hospitals then employed pharmacists, who are able to dispense drugs in their institutions, making many drugstores redundant. Hospitals and clinics are now still able to prescribe and dispense drugs, which again provide incentives for physicians to enhance their profits by prescribing high amounts of drugs and increasing costs of out-patient treatment (Rabobank International, 1999, chapter 3).

5.4 Reimbursing in-patient treatment

After the introduction of the NHI a new reimbursement system for in-patient care was introduced to lower costs of in-patient treatment. In 1995 the NHI announced the transformation of the fee-for-service payment to a system of DRG's case-based reimbursement. This was supposed to provide incentives for hospitals to lower their costs of treatment, since they otherwise could not cover them with the given DRG's. At present 50 items are reimbursed via DRG, while all other items are still reimbursed via the fee-for-service system. According to government officials it will take another 3-5 years to replace all fee-for-service items by DRG's. Total in-patient costs can be divided into costs per day of hospitalization respective to price market prizes and days of stay per case respective to the demanded volume¹⁴.

After DRG's were introduced the average days of hospitalization decreased from 9.41 days in 1995 to 8.68 in 1999. It can be surmised that this development was due to the establishment of DRG's, as the number of DRG reimbursed items has increased annually. While in 1995 only 10% of all cases were reimbursed via DRG's, in 1999 the share was already 17.5% (Bureau of National Health Insurance [BNHI], 1999a, table 57).

Taking a closer look at the structure of reimbursed cases, days of stay for the cases reimbursed via the DRG system have not decreased since they were introduced. They have rather increased from 3.2 days in 1995 to 3.7 days in 1999 (see figure 16)

¹⁴ This information was gleaned from interviews with NHI Officials.

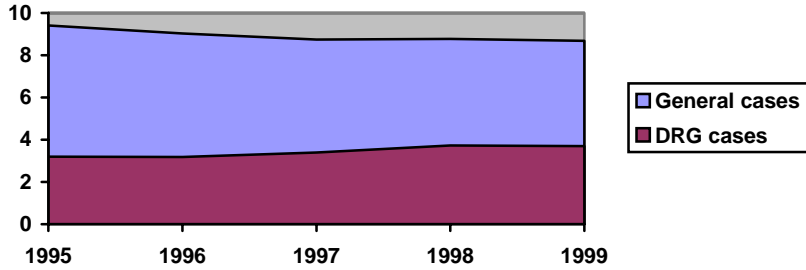


Figure 16: Length of Stay per General Case and DRG Reimbursed Case in Days (Bureau of National Health Insurance [BNHI], 1999a, table 57)

The reason for this could probably be found in the complexity of DRG's. When they were introduced in 1995 only very obvious cases, e.g. appendectomy, were switched to DRG reimbursement, but the more DRG's are created the more complex they become. Therefore, the length of days for DRG reimbursed cases as a whole could have increased as a result of more complex cases.

The complexity of DRG's also gives physicians the chance to get around DRG reimbursement by defining cases as multimorbid. These special cases do not fit into DRG's, because they originate in different diseases or illnesses. But if cases do not fit into DRG's they are reimbursed via the fee-for-service system. Since it is hard to prove that a case is not multimorbid, this provides a further incentive to hospital physicians to enhance their own and the hospital's incomes. According to Health Officials, physicians' definitions of rather simple cases as multimorbid is a serious threat to Taiwan's DRG system due to the increasing costs of in-patient treatment¹⁵.

But the increasing complexity of cases is not the only reason for sharply rising average costs of hospital stay per day. Since NHI was introduced costs per day increased from US\$ 105 in 1995 up to US\$ 133 in 1999 (see figure 17).

¹⁵ This information was gleaned from interviews with NHI Officials.

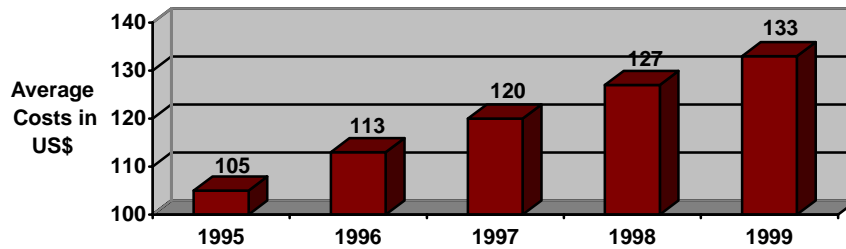


Figure 17: Average Cost of Hospital Stay per Day (Bureau of National Health Insurance [BNHI], 1999a, table 57)

This significant increase of more than 26 % could also partially be due to the shift of patients from other hospitals to medical centers. Even more than in out-patient treatment patients prefer to be hospitalized in larger, better equipped medical centers than in regional or district hospitals. This trend contributes to the rising average costs since medical centers charge US\$ 173 per day compared to US\$ 80 in district hospitals. Again, co-payments fail to interrupt this trend, as they are not differentiated by type of hospital. Patients pay a general 10% co-payment for the treatment, if they stay longer than 30 days, they pay 20% and if longer than 60 days, they will have to pay 30%. There are different definitions for co-payments of chronic patients and a ceiling for co-payments of US\$ 688 per 30 days of hospital stay per year (see Appendix 10). Hence, patients prefer to be treated in expensive medical centers since it does not mean more co-payments for them (Bureau of National Health Insurance [BNHI], 1999a, table 59)

Another source of high treatment costs is the inefficiency of public hospitals. Although from 1970-1999 the share of private hospitals of the total number of hospitals in Taiwan nearly doubled, 39% of Taiwan's hospital beds are still publicly owned. Private hospitals in Taiwan are run significantly more efficiently than public hospitals. While the average length of days of hospital stay per case in public hospitals is 11.84 days, private hospitals release earlier, at 7.76 days. The average cost of hospital stay per day is also higher in public hospitals, at US\$ 122 than in private hospitals, which charge an average of US\$ 138 per day (Bureau of National Health Insurance [BNHI], 1999a, table 51).

5.5 Reimbursement of pharmaceuticals and market intervention in Taiwan

The ratio of drug expenditures in Taiwan to total health care expenditure is estimated to be 27%. Compared to other countries like Germany (15%), USA (9%) and UK (16.6%) this ratio is very high, representing the main reason for health authorities in Taiwan to control reimbursement of drugs (Cheng, C., 1999, p. 5).

According to pharmaceutical companies reimbursement procedures in Taiwan are the most difficult in the world. It takes up to 3 years for a new product to get registered since approval is delayed at many points during the process. When a company wants to register a new product, which is either a new chemical entity, a new combination or characterized by a new administration route (new method of usage), it has to conduct a clinical trial or prove ethnic insensitivity to the product. For a clinical trial the company has to find a regional or medical center which is qualified to prove the effectiveness of the product by testing it on at least 40 persons. The more persons are tested the higher is the market barrier for possible generic imitators, since they have to conduct a trial of the same size to be allowed to copy a product within the first seven years after product launch. A trial report approval issued by the Department of Health can take up to 2 years. Another way of receiving a trial report approval is to prove ethnic insensitivity. In this case the product has to be already registered in other countries and a clinical trial in these countries must have included Taiwanese or at least Asian patients to prove its similar effectiveness on Taiwanese patients. If it is registered in other countries but has not proven ethnic sensitivity, a bridging study has to be conducted to add this. Bridging studies are similar in costs to normal clinical trials, and so companies have to check the efficiency of this kind of study thoroughly (International Research Based Pharmaceutical Manufacturers Association [IRPMA], 2000, pp. 7-8).

In addition to a trial report approval companies have to apply for product registration approval. This first includes an inspection review, which is difficult for Taiwanese authorities in cases of foreign production siting since they cannot officially visit factories in other countries due to Taiwan's diplomatic isolation. Instead of reviewing factories personally, they require companies

to submit plant master files. These files comprise very detailed descriptions of foreign factories and of the production process. After receiving the plant master approval the drug company has to submit registration dossiers to the Department of Health, including pharmacological, toxicological and pharmacokinetic studies. After another inspection by the National Laboratories of Food and Drugs, the product approval and therefore the product license is issued. The procedure just described is required for an ethnic drug and registration of OTC drugs requires even more documents (Schering Taiwan Ltd. Database, 2000).

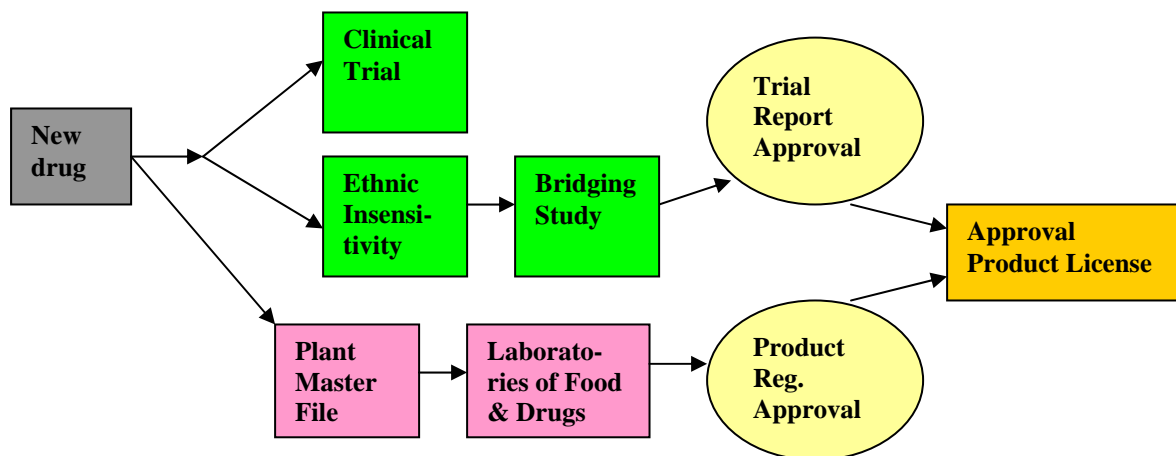


Figure 18: Registration Process in Taiwan (Schering Taiwan Ltd. Database, 2000)

Registration procedures in Taiwan represent a high market barrier for pharmaceutical companies. In particular, multinationals importing drugs are faced with the requirement of plant master files, which means high costs to companies since in many cases the files have to be translated from other languages to English. Another issue is regarding the safety of plant master files; companies do not trust the Department of Health to treat their documents confidentially. Multinationals suspect the Department of Health hand confidential information to local generic producers, who are then able to copy products identically. These high costs, combined with the uncertainty, might defer many multinationals from launching new innovative products on the Taiwanese (International Research Based Pharmaceutical Manufacturers Association [IRPMA], 2000, p. 8).

Another problem is patent protection in Taiwan, which lasts 20 years with a possibility of prolongation for 5 years. Most multinationals do not include Taiwan when they apply for patent protection worldwide, but it is not possible to patent a product afterwards if it has already been registered in other countries. Therefore, most products of multinationals are not patent protected, but administratively protected for seven years. Administrative protection allows for the fact that generic producers can only copy products within seven years if imitators conduct a clinical trial of the same size as the original producer. This uncertainty regarding protection and hence amortization of R&D and launching costs is a further reason for multinationals to hesitate with products launches (Schering Taiwan Ltd. Database, 2000).

In addition drugs for Chinese medicine are reimbursed at a flat rate of US\$ 1 per day, ingredients are not reviewed, since variety of drugs is much too big and hence opportunity costs would be too high. As moral hazard is widespread in this segment of drugs the non-reviewed reimbursement of drugs for Chinese medicine is often subject to criticism.

Altogether multinational companies have to consider many uncertainties, high costs and long waiting periods before launching an innovative new product. After integrating all these factors in launch calculations, companies often decide not to launch a product, which means a loss of welfare for Taiwan, since possible diseases cannot be cured without using this drug.

If companies decide to register and launch a product, they are faced with many kinds of market intervention to control reimbursement of pharmaceuticals. But before turning to market intervention in Taiwan the so-called “black hole” has to be mentioned, since it overshadows the whole pharmaceutical market. This refers to the phenomenon of companies having to pay “black money” to hospitals for various reasons. On the one hand, nearly every drug company is requested by hospitals to pay for listing of its products. If the product is not listed in a hospital, it cannot be sold to this institution. On the other hand, hospitals and clinics request free samples or bonuses from the company if certain amounts of products are ordered. Physicians and other employees enhance their incomes illegally with this method of payment. Under the table payments by drug companies represent a kind of subsidizing effect for health care services, since

providers, e.g. hospitals, would otherwise request higher reimbursements for services from NHI. Therefore the Department of Health seems to tolerate or ignore this “black hole”, since it is aware of its cost containing effects. The “black hole” can cause up to 30% lower prices for drug companies, who in fact have to integrate “black hole” expenditures into their cost calculations. Figure 19 uncovers the estimated “black hole” between BNHI expenditures for pharmaceuticals and de facto revenues of pharmaceutical companies (Cheung, D., 1999, pp. 8-11; International Research Based Pharmaceutical Manufacturers Association [IRPMA], 2000, p. 7).

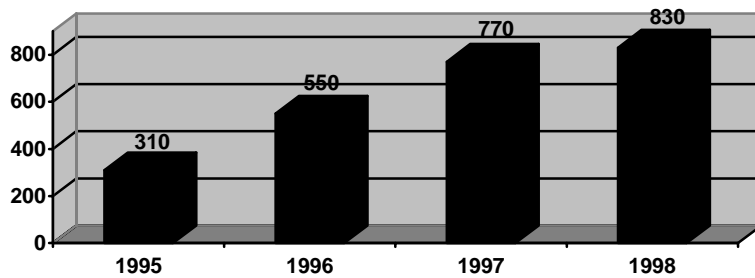


Figure 19: Price Gap between BNHI Drug Expenditure and de facto Expenditure (in bln US\$) (Cheung, D., 1999, pp. 8-11; International Research Based Pharmaceutical Manufacturers Association [IRPMA], 2000, p. 7)

This black hole can be interpreted as market failure, since it results from asymmetric information. If the relationship between BNHI and hospitals is regarded as a principal-agent relationship, hospitals as agents have more information about prices of drugs than their principal the BNHI. Therefore, agents have the possibility of abusing the information to their own advantage and skimming drug companies’ profits in order to enhance their own profits, thereby endangering market mechanisms and cost effective access to pharmaceuticals.

Supply side price controls are the most dominant form of reimbursement controls in Taiwan. At the end of 1996 a reference pricing system was introduced to lower costs of pharmaceutical spending. According to this system products are reimbursed at the median price of ten advanced reference countries (UK, USA, Germany, Australia, Japan, Sweden, Switzerland, Belgium, Canada, France). Originals are reimbursed at 100%, bioequivalent generics at 90% and non-

bioequivalent generics at 80% of the median reference price. The result of this market intervention can be regarded as a short-term effect, since growth of pharmaceutical expenditures only slowed down for 1997 to 3.0% right after introduction. In 1998 growth of pharmaceutical expenditures was even higher than before with 12.2% growth, similar to the effect set off in Germany in 1989, as evaluated in 4.4.. In addition the high reimbursement of generics led to sharp price competition between generic and original producers. Generic producers do not have to cover R&D costs, which can sometimes amount to 50% of the costs for original producers, and therefore have higher profit margins. The local generic producers usually use some of these high profit margins for discounts given to hospitals, enlarging the incomes of physicians and pharmacists. Thus, hospitals demand the same discounts from producers of originals, but sometimes they cannot cover their R&D costs anymore and drop out of the market, leading to a lower willingness to launch innovative products (Lai, M.-S., 1999, pp. 13-18; Cheung, D., 1999, pp. 13-19; Bureau of National Health Insurance [BNHI], 1999c, pp. 2-5).

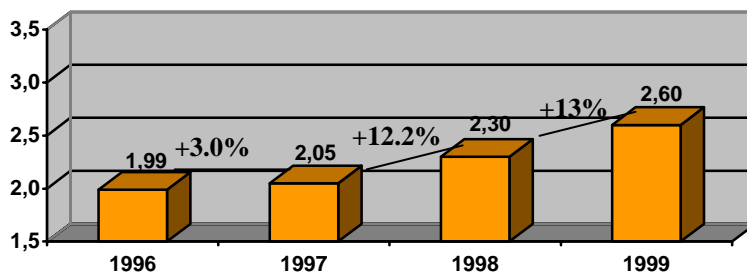


Figure 20: Health Insurance Expenditure on Pharmaceuticals in bln US\$ (Lai, M., 1999, p. 10)

There could be several reasons for this development, but it is most likely due to substitution effects. When Taiwanese health authorities recognized the failure of the reference pricing system, they established the so-called therapeutic grouping as another price intervention method. Products are grouped in classes with similar molecules and the reimbursement price depends on prices of other products of the same molecule group. This cost control measure is applied after setting a reference price, but the grouping has priority if the product fits in a certain group, e.g. if

the reference price of an original is set at US\$ 3.2, but the grouped price is only US\$ 2.24, the final reimbursement price is US\$ 2.24. Originals are slightly more highly reimbursed than generics, but there are no clear criteria recognizable in differentiating originals and generics. The effects of the therapeutic product grouping cannot yet be reported since it has only recently been introduced. The IRPMA (International Research Based Pharmaceutical Manufacturers Association) of the Republic of China criticizes the grouping of products for not appreciating the quality, consistency and safety of the original product (International Research Based Pharmaceutical Manufacturers Association [IRPMA], 2000, pp. 7-9).

Apart from supply-side price controls Taiwan's health authorities also make use of demand side price controls. In spite of the rejection of labor insurance and trade unions, in April 1999 drug co-payments of up to US\$ 3.2 were introduced. Products with reimbursement prices below US\$ 3.2 are free of co-payment and low-income patients generally do not have to pay. Co-payments for drugs again have the purpose of creating cost-awareness in the patients' minds. As pointed out in 4.4. co-payments are generally a market intervention without negative effects on distribution of drugs and innovative activities. They rather help to increase social welfare by expressing individual preferences. But just like co-payments of out-patient and in-patient treatment they are much too low and therefore ineffective. Co-payment policy also has the function of strengthening generics, since patients are likely to be more insistent on receiving generics in order to save costs¹⁶.

Demand side volume controls do exist in Taiwan, but are not as established as negative and positive lists in other countries, e.g. the USA. There are certain guidelines for allowing prescriptions and reimbursements, although they are rather created on a case-to-case basis. These guidelines are set up centrally and a structure cannot be recognized (Schering Taiwan Ltd. Database, 2000). As described above, reimbursement approvals are very restrictive in Taiwan and hence volumes are generally strictly controlled in this way.

¹⁶ This information was obtained in interviews with officials of the BNHI.

Spending controls have so far only been introduced for the supply side as a so-called “Volume Price Survey” has been set up in 1999. Every quarter drug companies have to submit their selling data regarding price and volume of sold products. This information firstly helps the BNHI to discover the black hole, since it uncovers the difference between the reimbursement price to hospitals and the actual selling price of drug companies. Thus the BNHI is able to cut down reimbursement prices in order to save costs and at the same time to reduce the black hole, as companies will not be able to pay the same benefits as before. On the one hand, this measure can contribute to reduced market failure as a result of asymmetric information. The black hole could only exist due to missing information and hence will be tackled by this method. On the other hand, the BNHI could misuse this information to radically reduce the profits of innovative research based drug companies, causing negative effects on innovative activity (Lai, M.-S., 1999, p. 14).

Demand side spending controls were only introduced for dental services in 1999. Dental services are now globally budgeted, setting off only small-scale side effects on drugs for dental services. According to the BNHI, this introduction has been a great success, but this has yet to be empirically proved. A quasi demand side spending intervention is the standard fee of US\$ 3.2 for prescriptions in out-patient clinic treatment. As described above, physicians of clinics usually do not exceed this standard fee of US\$ 3.2 per three-day-prescription, since they otherwise have to apply for more and list their prescribed products in detail. Therefore the standard fee for drugs in clinics has the character of a physician’s drug budget¹⁷.

Altogether it can be stated, that the “black hole” problem together with several forms of market intervention and long registration procedures creates a difficult environment for reimbursement of pharmaceuticals in Taiwan. These problems represent massive trade barriers for pharmaceutical companies, prevent launches of new innovative products and therefore set off negative welfare effects.

¹⁷ This information was gleaned from interviews with officials of the BNHI.

6. Ensuring cost-effective access to health care for the future: actions taken by the Taiwanese government and recommendations for improvement

Although the new health care system was able to improve provision of health care in many areas, several new problems have appeared, which have to be solved in the future. The following chapter discusses approaches of the BNHI, as well as considering other theoretical alternatives to problem solving.

6.1 Finance mechanism

As mentioned in 6.2., there are several reasons for the increasing losses of the BNHI. So far the Government has not taken any action on the revenue side to tackle the deficit, it is primarily concerned with changes to the spending side, e.g. global budgeting as evaluated in 7.2.-7.4.. But if Taiwan intends to avoid impeding the growth of the health care sector, it is necessary to think about ways to increase revenues for the NHI or finding alternative financing. To maintain a working health care system, the Taiwanese Government has basically two options. On the one hand, it could try to solve the given problems within the framework of the defined system in a kind of inherent approach. On the other hand, there might be some alternative models of financing health care, which are more appropriate for the structure of Taiwan. The search for alternative models could be described as transcendental approach.

As referred to above, premiums are very low at 4.25% of the income. They should be increased to at least 6%, which is still allowed by the Health Insurance Act. This would add approximately US\$ 0.4 bln to the total amount of premium revenues and is enough to cover nearly half of the NHI's deficit. Insurance systems in other developed countries typically receive more than 10% of premiums. This amount should be appropriate for Taiwan as well. Higher co-payments, especially for out-patient treatment and medicines, represent another possible means of reducing the deficit. According to calculations of the IRPMA, an additional co-payment of only US\$ 1 for out-patient services would have the significant effect of adding about US\$ 0.2 bln to the total premium revenues. This calculation excludes elderly, pregnant and chronically ill persons

(International Research Based Pharmaceutical Manufacturers Association [IRPMA], 2000, p.9). But while discussing these issues it has to be considered, that Taiwan's political and cultural situation is totally different from the situation in other countries. Therefore, it could be very difficult for the Taiwanese Government to achieve these goals. First of all the majority of the ruling party is very small and taking any critical decision can be politically precarious. Furthermore, as revealed in 6.2., Taiwan is standing in Confucian tradition regarding the state as a father. Taiwanese people accustomed to this view may well accuse the government of neglecting its task of protecting its dependents. To find a broader consensus on methods to finance the system it could be advisable to establish a kind of concerted action group like in Germany, in which representatives of all interest groups, e.g. insured, hospitals and physicians, participate and advise the Department of Health (Henke, K.-D., 2000a, p. 14). In this way it could be possible to find a compromise, which is generally accepted.

However, in the long-term, with an aging population and rapidly escalating costs, Taiwan has to look for a different finance system to provide sufficient health care and to encourage the growth of the health care sector. One approach could be to privatize the NHI, to open the market to private insurance, and to transform the system to a more individualistic model. It is estimated that this would result in a boost of around US\$ 7 bln for the whole health care sector (Rabobank, 1999, chapter 3). Competition among insurance companies would therefore increase Taiwan's welfare, as privatizing of health insurance has already proved in other countries (Henke, K.-D., 1996, pp. 447-448). At the same time, insurance companies would have the obligation to contract out in order to avoid counter selection. Patients would then be able to choose between several insurance companies and their specific programs. Premiums and co-payments for NHI insured persons would be likely to rise in this case since many "good" risks will choose a private insurance company with lower premiums and higher co-payments. In contrast to this, "bad" risks will see themselves confronted with much higher premiums. This is likely to lead back to a situation similar to that before 1995, when many "bad" risks could not afford any insurance at all. Therefore, another approach could be to maintain the NHI as a mandatory insurance, which only reimburses basic needs. Many dental services as well as Chinese medicine would then be

excluded, lowering costs by a further US\$ 1 bln of lower costs¹⁸. In addition many other services could also be excluded to lower reimbursements. Persons requiring additional services could then insure themselves with private insurance programs.

Regarding a possible WHO entry, Taiwan has already prepared for regulations set for membership of the WHO. The WHO has defined 10 global targets, which have to be met by each member, to set priorities for resource allocation in each country and therefore to achieve the global vision of “Health for All”. With its new health care system Taiwan meets already all these targets. In particular, for the system of financing the Department of health repeatedly emphasizes the goal of achieving a sustainable system providing access to everyone. These two elements already meet some of the targets defined by the WHO (WHO, 2000, p.5, p. 21; Bureau of National Health Insurance [BNHI], 1999d, chapter 7).

6.2 Out-patient treatment

High costs of treatment and high frequency of visits are the two major problems of out-patient treatment. There are several possible approaches to these problems. Currently the government seems to be in favor of global budgets which will be introduced in 2001 for every single health care sector. In addition, a point value scale system is under discussion, similar to that established in Germany in 1987. With this approach physicians receive a certain number of points for defined services. The monetary value of every point is either determined retrospectively or prospectively. In the case of the retrospective method, at the end of one period the capped budget is divided by the total number of points requested respective to the total amount of services provided. The result is equal to the monetary value of each point; therefore, the physician’s reimbursement is calculated by multiplying the number of received points by the monetary value of one point. The problem with this alternative is that physicians do not know exactly how much they will be paid, when they treat patients. To avoid this uncertainty it is possible to estimate the demand and calculate the points prospectively (Henke, K.-D. / Murray, M. A. / Ade, C. G., 1994a, p. 256).

¹⁸ This number is based on own assumptions.

While discussing these possible approaches the Taiwanese government should consider the fact that the better a reimbursement system is constructed the less it is necessary to think of a way of rationing out-patient health care services. Rationing of out-patient health care could set off several negative effects: either patients do not received urgently needed treatment or the quality of treatment suffers since physicians do not feel motivated or are uncertain about their incomes. Rationing surely encourages misallocation of resources and hence other alternatives should be considered with the aim of rationalizing health care (Henke, K.-D., 2000a, p. 11).

First of all costs of treatment could be much lower if there would be a working referral system. This can only be achieved, if patients are obliged to go to clinics first. Many physicians in Taiwan agree that most of the cases can be treated by clinics¹⁹. Therefore the government should implement a mandatory referral system for everyone. Someone wanting to request treatment of higher quality or reputation without being referred would have to pay high co-payments. In this way, it is possible to meet everybody's preferences and at the same time to prevent misallocation. Furthermore, consideration could be given to the introduction of capitation reimbursement for all out-patient services including consultation, treatment and medical supply. Every provider would receive a standard fee per case and would have to make sure that the costs of treatment are covered by this fee. This is likely to improve efficiency and allocation of resources, but could be a danger to the quality of the treatment. In this case strict guidelines need to be set up to maintain a certain quality in the treatment of patients.

It seems obvious to point out that large numbers of treatment sessions are not necessary. However, hospital physicians especially accuse patients of too often requesting treatment for minor illnesses that do not need any medical treatment at all²⁰. Once again, increasing co-payments for out-patient care could lead to greater efficiency. This will avoid multiple examinations, reduce the number of unnecessary visits and therefore improve allocation.

¹⁹ This information was gleaned from interviews with physicians and BNHI officials.

²⁰ This information was gleaned from interviews with physicians in hospitals and clinics.

The Taiwanese government has recently announced its intention to introduce a monitoring system for out-patient and later for in-patient treatment. This system will be implemented as a computer network linking all hospitals, clinics and health authorities. Hospitals will then be able to check all data on any patient and find out whether the patient has been treated for the same symptoms before. It will therefore be possible for physicians to avoid multiple examinations, and will also enable the BNHI to monitor misuse of resources closely.

6.3 In-patient treatment

As mentioned in 6.3., patients tend to request hospitalization in larger hospitals, which is very costly. There are two alternatives for handling this kind of problem. On the one side the Department of Health could improve the quality of treatment in district hospitals by setting up certain obligatory standards. This approach would cause higher costs for district hospitals, but it would be able in the long term to decrease costs for in-patient treatment as a whole. The remaining question is to what extent the standard has to be improved to prevent patients from requesting larger hospitals and whether it is affordable. This point has to be analyzed by further research, e.g. a sensitivity analysis. Another solution could be seen in higher co-payments. Sharp progressive co-payments could lead to lower referrals to regional hospitals and medical centers. The higher the level of treatment, the higher the co-payments; this will improve allocation and decrease costs for the NHI. Elderly and low-income residents would again be excluded from co-payments. Both alternatives could also be combined in a “mixed” approach of lifting standards of district hospitals and establishing progressive co-payments.

Another problem of in-patient treatment is the low rate of DRG usage at present. Only 50 items are currently reimbursed via DRG's and it will take the Government many years to establish DRG's for every item. As demonstrated in 6.3., the introduction of DRG's had a positive effect on the number of days of hospital stay, and subsequently on total costs. Therefore, the government should try to introduce DRG's for other items as soon as possible and overcome resistance from physicians who want to avoid DRG's, arguing that quality would be adversely affected.

Another issue is the privatization of hospitals. As private hospitals operate much more efficiently than public hospitals, the government should try to privatize the majority of the 39% of hospitals that are public. Although this would require an unpopular decision on the part of the government, it could result in more efficient treatment and better cost savings. This approach has also been used in other countries, e.g. in the USA and partially in Germany, with great success (Henke, K.-D., 2000b, p. 71).

6.4 Pharmaceuticals

In order to ensure cost-effective but still sufficient access to pharmaceuticals, registration procedures need to become shorter to accelerate the speed of market entry for new products. Methods of market intervention have to be reviewed from the perspective of ensuring working market mechanisms. Furthermore, the effects of change in other parts of the health care system have to be considered. Policy amendments such as these should encourage research based pharmaceutical companies to enter the Taiwanese market with innovative products and to achieve a competitive market in order to provide fair prices to consumers, while at the same time avoiding monopolistic market structures. These two aims are contradictory to a certain extent, but have the common function of increasing the welfare of Taiwan's society.

First of all changes in registration procedures dependent on the policy of the Department of Health. It currently reviewing the requirements for bridging studies. The main issue is the necessity to prove ethnic insensitivity to products especially for Taiwanese, since international guidelines differentiate only between three different ethnic groups: A/Asian, B/Black, C/Caucasian. The BNHI seems to favor bridging studies specifically for locals, including aborigines, but this results in high costs for companies that want to conduct an additional clinical trial, since they usually already conducted a large-scale clinical trial according to international guidelines for a new product. Insisting on these requirements, Taiwanese authorities would again contribute to building up unnecessary market barriers, instead of reducing them. The Department of Health should generally make an effort to improve recognition of international clinical trials to

ease market entries for innovative products (International Research Based Pharmaceutical Manufacturers Association [IRPMA], 2000, p. 7-8)

Complex requirements for plant master files can only be lifted, if Taiwan is allowed to enter the international organization PIC/S (Pharmaceutical Inspection Cooperation Scheme), since the end of the nation's diplomatic isolation seems unlikely. PIC/S has the purpose of standardizing inspection reports for all members; in this case e.g. German authorities would inspect factories in Germany for Taiwan's authorities. Therefore Taiwan would not have to send an official delegation to Germany or require plant master files. Taiwan is lobbying hard for entry to the PIC/S, but again Taiwan can only gain access after China.

Secondly, the pharmaceutical market in Taiwan is more and more restricted by market intervention and therefore becoming unattractive for foreign investors. After having introduced group pricing and reference pricing as major price control intervention, health authorities have now announced to impose a global budget as spending control on reimbursement of pharmaceuticals by 1.1.2001 or 1.7.2001. But this measure needs to be thoroughly reconsidered, since experiences of other countries, e.g. Germany, have revealed that cost-savings in global drug budgets are usually offset by increased expenditures in other areas of the health care system. If all areas are budgeted and other parts cannot substitute due to a lack of resources, as planned by the Department of Health, out-of-pocket payments will replace insurance benefits. In this case out-of-pocket payments have a similar character as co-payments, but lead to misallocation of resources, since in contrast to co-payments e.g. low-income residents also have to pay them, but cannot afford them. This would again cause insufficient provision of pharmaceuticals and unequal access for residents, and hence cause the same problems as before the introduction of the NHI. The state as a "father" would therefore abandon its Confucian obligation to care for weak "family members". A raise in co-payments for drugs as a demand price intervention represents a much more efficient alternative to save costs and maximize social welfare at the same time. As already stated above, co-payments allocate resources according to individual preferences and still provide equal access. But so far co-payments in Taiwan are much too low to set off any

allocation effects at all. Therefore, health authorities should try to overcome political and social resistance and increase co-payments for pharmaceuticals.

A working out-patient referral system could affect local as well as multinational drug companies; so far, given the large sales of hospitals, it is possible for some companies to build up a business with just two big hospitals as customers. But with a working referral system they would have to create a distribution channel for clinics, which is very cost- intensive and will create a market barrier for possible start-ups. On the other hand, branded product manufacturers usually have hardly any distribution channels to clinics, so they will also have to restructure their business. Prices of pharmaceutical products are likely to increase since the costs of distribution of companies are rising.

References

- Boston Consulting Group (BCG) Inc.*, Ensuring Cost-Effective Access to Innovative Pharmaceuticals: Do Market Interventions Work?, Boston, 1999.
- Bruhlmann, Patrik*, Focus on Taiwan – A time of transition, *Zuellig Pharma Review*, Issue 13, 2000, pp. 2-5.
- Bureau of National Health Insurance (BNHI)*, National Health Insurance Annual Statistical Report of the Republic of China, Taipei, 1999a.
- Bureau of National Health Insurance (BNHI)*, National Health Insurance Profile, Taiwan Republic of China, Taipei, 1999b.
- Bureau of National Health Insurance (BNHI)*, Pharmaceutical Benefit Scheme for National Health Insurance, Taiwan Republic of China, Taipei, 1999c.
- Bureau of National Health Insurance (BNHI)*, Public Health Annual Report, Taiwan Republic of China, Taipei, 1999d.
- Cambridge Pharma Consultancy (CPC)*, Impact of Reference Prices on Pharmaceutical Public Expenditure, Cambridge, 1998.
- Chen, Michael*, Values in Health Care Systems: Implications for Taiwan's National Health Insurance Reform, *Journal of National Chung Cheng University Sec. II: Social Sciences*, Vol. 6 No. 1, 1995, pp. 97-125.
- Cheng, Carol*, The Challenges To Research Based Pharmaceutical Companies, Presentation for Members of IRPMA (International Research Based Pharmaceutical Manufacturers Association) in Taipei, 23/12/1999.
- Cheung, Douglas*, Price Controls and Cost Containment in Taiwan, Presentation for Members of IRPMA (International Research Based Pharmaceutical Manufacturers Association) in Taipei, 18/11/1999.
- Chiang, Boon. Y.*, The Plan for the National Health Insurance: Report to Legislative Yuan, Taiwan: Ministry of Health, Taipei, 1993.
- Council for Economic Planning and Development (CEPD) of the Republic of China*, Economic Development of Taiwan, Republic of China, Taipei, 1999.
- Council for Economic Planning and Development (CEPD) of the Republic of China*, Taiwan Statistical Data Book, Taipei, 2000.

- Department of Health of the Republic of China*, Public Health Annual Report, Taipei, 2000.
- Directorate General of Budget, Accounting and Statistics*, Statistical Yearbook of the Republic of China 1999, Executive Yuan of the Republic of China, Taipei, 1999.
- Dranove, David*, Rate-Setting by Diagnosis Related Groups and Hospital Specialization, *Rand Journal of Economics*, Vol. 18, Issue 3, 1987, pp. 417-427.
- The Economist*, Time to Talk about Taiwan, in: *The Economist*, Week 31, 2000, pp. 27-28.
- Evans, Robert*, Tension, Compression and Shear: Directions, Stresses, Outcomes and Health Care Cost Control, *Journal of Health Politics, Policy and Law* 15, 1. Issue, 1990, pp. 101-128.
- Evans, Robert*, Canada: The Real Issues, *Journal of Health Politics, Policy and Law* 17, 4. Issue, 1992, pp. 739-762.
- Evers, Peter*, New Drug Approval in the European Union, *Worldwide Pharmaceutical Regulation Series*, Waltham, 1995.
- Glaser, William. A.*, Payment Systems and Their Effects, in: Aiken, L.H., and Mechanic, D., *Application of Social Science to Clinical Medicine and Health Policy*, New Brunswick, 1986, pp. 481-499.
- Green, Dennis, et al.*, Should Pharmaceutical Prices be Regulated? The Strengths and Weaknesses of the British Pharmaceutical Price Regulation Scheme, London, 1997.
- Grupp, Rudolf*, Gesundheitsstrukturgesetz 1993 – Abschied vom Selbstkostendeckungsprinzip, in: Arnold, M. / Paffrath, D., *Krankenhausreport 1993*, Stuttgart-Jena, 1993, pp. 1-16.
- Günster, Christian*, Australian Refined Diagnosis Related Groups (AR-DRGs) – Eine Einführung, Wissenschaftliches Institut der AOK, München, 2000, (<http://www.wido.de/Krankenhaus/drg/drgAdaption/AR-DRGs.html>).
- Henke, Klaus-Dirk*, International Comparisons of Health Care Systems –A Comment on Bengt Jöhnsson's paper, What can Americans learn from Europeans, in: OECD, *Health Care Systems in Transition*, Social Policy Studies, No. 7, Paris, 1990, pp. 101-104.
- Henke, Klaus-Dirk*, Krankenkassenwettbewerb oder Einheitskasse? Die Stärkung des Wettbewerbs ist eine sinnvolle Option, *Wirtschaftsdienst*, Issue IX, 1996, pp. 447-448.
- Henke, Klaus-Dirk*, Chances and Risks of Private Insurance: An International Perspective, *Speech for Münchner Rück*, 27.7.98.

- Henke, Klaus-Dirk*, Efficiency Scrutiny of Financing Expenditures in Health Care in Novosibirsk and Rostov Oblast and Proposals for Reform, Diskussionspapiere zu Staat und Wirtschaft, 12/2000, 2000a.
- Henke, Klaus-Dirk*, Privatisierung öffentlicher Krankenhäuser am Beispiel der Bundeshauptstadt Berlin, in: Henke, K.-D. / Hofmann, A. / Hoppe, J.-D. / Schröder, J.-P. / Wandschneider, U., Innovatives Gesundheitsmanagement im Zeichen Europas, München, 2000b, pp. 71-75.
- Henke, Klaus-Dirk, Göppfarth, Dirk*, Das Krankenhaus im System der Gesundheitsversorgung, in: Hentze, J. / Huch, B. / Kehres, E., Krankenhaus-Controlling-Konzepte, Methoden und Erfahrungen aus der Krankenhauspraxis, Stuttgart, 2000, pp. 1-16.
- Henke, Klaus-Dirk / Hesse, Michael*, Ökonomik des Gesundheitswesens: Ein allokativ und distributiv orientierter Überblick, in: Korff, W. et al., Handbuch der Wirtschafts-ethik, Gütersloh, 1999, pp. 249-289.
- Henke, Klaus-Dirk / Murray, Margaret A. / Ade, Claudia G.*, The German Health Care System: Structure and Changes, The Journal of Clinical Anesthesia, Vol. 6, 1994a, pp. 252-262.
- Henke, Klaus-Dirk, Murray, Margaret A. / Ade, Claudia G.*, Global Budgeting in Germany: Lessons for the United States, Health Affairs, Vol. 13, No. 4, 1994b, pp. 6-21.
- Henke, Klaus-Dirk / Scriba, Peter C.*, Rationalisierung oder Rationierung: Wege aus der Fortschrittsfalle, in: Diehl, V., Medizin an der Schwelle zum 21. Jahrhundert – zum Anlaß der 105. Jahrestagung der Deutschen Gesellschaft für Innere Medizin, München, 1999, pp. 21-26.
- Horn, Simon, et al.*, Formulary Limitations and The Ederly: Results from the Managed Care Outcomes Project, The American Journal of Managed Care, Issue 4, 1998, pp. 1105-1113.
- Hsiao, William / Lu, Rachel*, Taiwan's Health Care System and Its Challenges for Future Development, National Health Insurance Planning Task Force, Council for Economic Planning and Development, Taipei, 1989.
- Hsiao, William / Lu, Rachel / Yaung, Chih-Liang*, Health Care Financing and Delivery in the ROC: Current Conditions and Future Challenges, in: Industry of Free China, Vol. 5, 1990, pp. 15-38.
- Ikegami, Naoki*, Japan: Maintaining Equity through Regulated Fees, Journal of Health Politics, Policy and Law 17, 4. Issue, 1992, pp. 689-713.
- Ikegami, Naoki / Ikeda, Shin-ichi / Kawai, Hiroki*, Why Medical Care Costs in Japan Have Increased Despite Declining Prices of Pharmaceuticals, PharmacoEconomics, Issue 14, Supplement 1, 1998, pp. 97-105.

- IRPMA (International Research Based Pharmaceutical Manufacturers Association)* of the Republic of China, Information letter: Pricing and Reimbursement Issues, Taipei, 14/09/2000.
- Kassenärztliche Bundesvereinigung*, Grunddaten zur Vertragsärztlichen Versorgung in der Bundesrepublik Deutschland, Köln, 1999.
- Lai, Mei-Shu*, Changes in Taiwan's Health Insurance: Implications for the Pharmaceutical Industry, Presentation on the PHRMA 12th Annual Asia Managers Conference, Taipei, 28/10/99.
- Lin, Chih-Hong*, Steuerungsprobleme und Reformbestrebungen des Gesundheitswesens in Taiwan, Dissertation an der Universität Bielefeld, Bielefeld, 1996.
- Lin, Kuoming*, Taiwan's Health Care Reforms in Comparative Perspectives, Unpublished discussion paper of the Department of Sociology at Yale University, 1994.
- Marshall, John*, Moral Hazard, *American Economic Review* 66, 1976, pp. 880-890.
- McCarthy, Claudia*, Financing for Health Care, in: Jonas S., Health Care Delivery in the United States, New York, 1981, pp. 272-312.
- Organisation for Economic Co-operation and Development (OECD)*, Financing and Delivering Health Care: A Comparative Analysis of OECD Countries, Social Policy Studies, No. 4, Paris, 1987.
- Organisation for Economic Co-operation and Development (OECD)*, Comparative Analysis of 29 countries, CD-version, Paris, 1999.
- Pauly, Mark*, The Economics of Moral Hazard, a Comment, *American Economic Review*, Issue 58, 1978, pp. 531-537.
- PriceWaterhouseCoopers*, Impact of the Crisis – Outlook for Asian Pharmaceutical Markets, unpublished document, 1999.
- PriceWaterhouseCoopers & Rabobank International*, Health Care Industry – Overviews by Country: HongKong, Indonesia, Malaysia, Singapore, Taiwan, Thailand, unpublished document, 1999.
- Rabobank International*, Asia Health Care: Impact of the Crisis – Immediate and Long- term Outlook for Asian Health Care Markets, unpublished document, 1999.
- Schering Taiwan Ltd. Database*, represents general information collected by Schering Taiwan Ltd., mainly presentations and unpublished documents, Taipei, 2000.

Schöffski, Oliver, Consequences of Implementing a Drug Budget for Office-Based Physicians in Germany, *PharmacoEconomics*, Issue 10, Supplement 2, 1996, pp. 37-47.

Schroeder, Stephen / Cantor, Joel, On Squeezing Balloons: Cost Control Fails Again, *New England Journal of Medicine*, Issue 325, 1991, pp. 1099-1100.

Schulenburg, J.-Matthias Graf von der, Preisbildung im Gesundheitswesen, in: Andersen, H. / Henke, K.-D. / Schulenburg, J.-M. Graf v.d., *Basiswissen Gesundheitsökonomie*, Berlin, 1992, pp. 111-134.

Thorpe, Kenneth. E., Health Care Cost Containment: Results and Lessons from the Past 20 Years, in: Rheinhardt, U., and Shortell, S., *Improving Health Policy and Management: Nine Critical Research Issues for the 1990s*, Michigan, 1992, pp. 227-274.

World Health Organisation (WHO), *Health for All in the Twenty-First Century*, Geneva, 2000, (<http://www.who.int/wha-1998/pdf98/ea5.pdf>).

Appendix

Appendix 1: Population by Age Group

Year	Under 15	15-65	Above 65	Total
1955	3.941	4.915	0.222	9.078
1960	4.904	5.620	0.268	10.792
1965	5.667	6.626	0.335	12.628
1970	5.821	8.426	0.429	14.676
1975	5.705	9.881	0.564	16.150
1980	5.714	11.329	0.762	17.805
1985	5.696	12.589	0.973	19.258
1990	5.510	13.579	1.264	20.353
1995	5.062	14.616	1.626	21.304
1999	4.722	15.454	1.858	22.034

Source: Council for Economic Planning and Development, 2000, table 4-15.

Appendix 2: Life Expectancy by Sex

Year	Male	Female	Total
1961	62.30	66.76	64.53
1965	65.10	69.71	67.41
1970	66.66	71.56	69.11
1975	68.27	73.42	70.85
1980	69.56	74.54	72.05
1985	70.82	75.81	73.32
1990	71.33	76.75	74.04
1995	71.93	77.79	74.86
1999	72.28	77.97	75.13

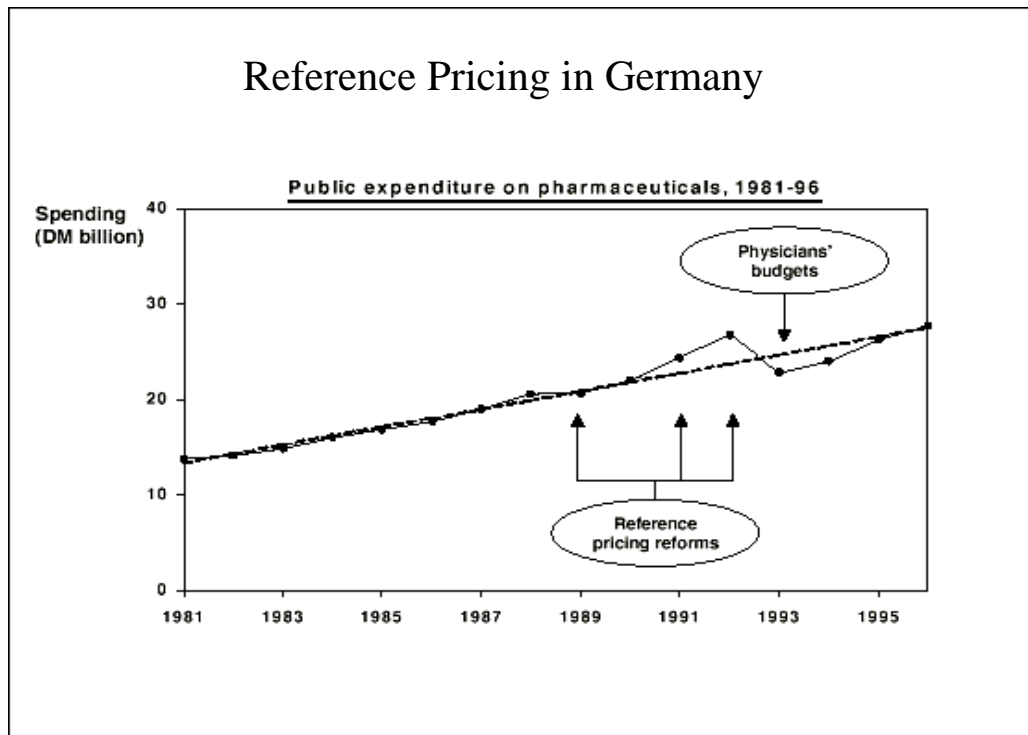
Source: Council for Economic Planning and Development, 2000, table 4-16.

Appendix 3: Insured and Uninsured Population by the End of 1992 (in 1000 persons)

Age	Total Population		The Insured			The Uninsured		
	Size	% of Total Population	Size	% of the Insured	% of the Same Age Group	Size	% of the Uninsured	% of the Same Age Group
<14	5.361	25.77	466	4.14	8.69	4.896	51.27	91.33
15-24	3.724	17.90	1.598	14.20	42.91	2.126	22.26	57.09
25-34	3.859	18.55	3.039	27.01	78.75	819	8.58	21.22
35-44	3.165	15.21	2.628	23.36	83.03	537	5.62	16.97
45-54	1.770	8.51	1.521	13.52	85.93	248	2.60	14.01
55-64	1.508	7.25	1.186	10.54	78.65	321	3.36	21.29
65+	1.416	6.81	814	7.23	57.49	602	6.31	42.51
Total	20.803	100	11.252	100	53.09	9.549	100	46.90

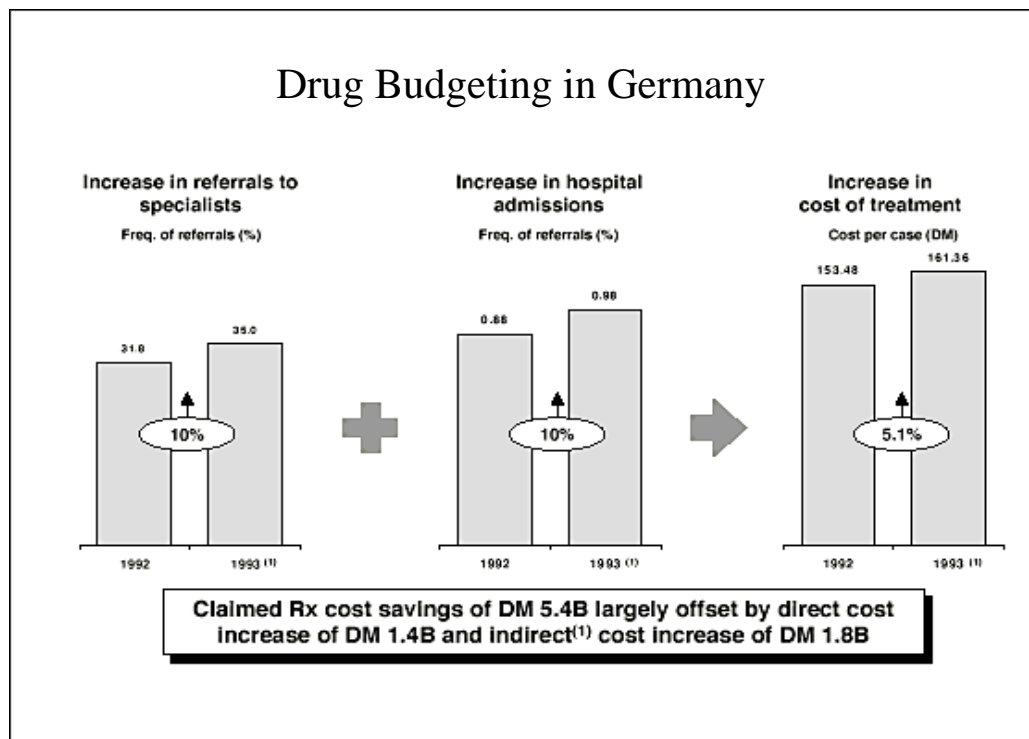
Source: Chiang, B.Y., 1993, p. 10.

Appendix 4: Reference Pricing in Germany



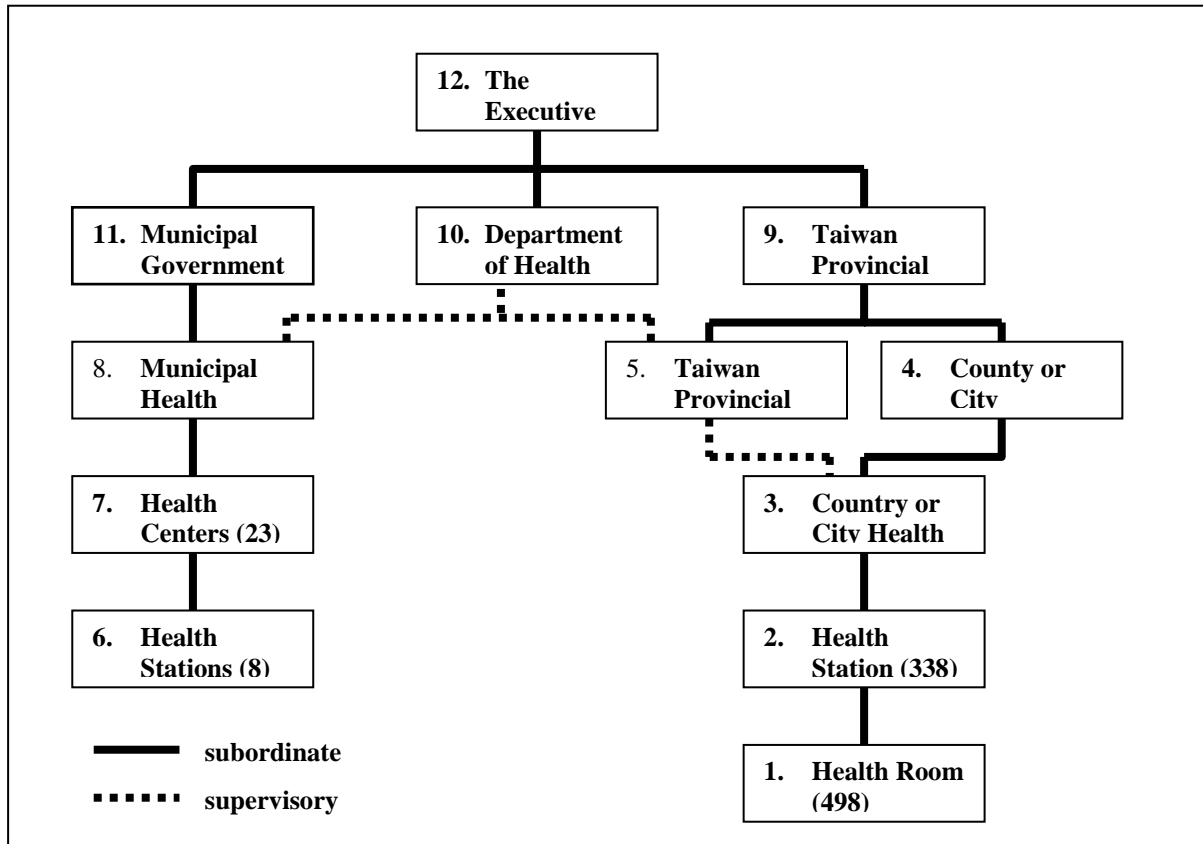
Source: Cambridge Pharma Consultancy, 1998, figure 12.

Appendix 5: Drug Budgeting in Germany



Source: Schöffski, O., 1996, p. 37.

Appendix 6: Organization of Health Care in Taiwan



Source: Department of Health, 2000, figure 1-6.

Appendix 7: Per Capita GDP Compared to Health Insurance Coverage of Population

Year	Mid-year population (in 1000)	Per Capita Income		No. Of Persons in Health Insurance Programs		Education (15 years +)	
		NT\$	US\$	Total (1000)	% of total population	Higher %	Literacy %
1956	9823	3296	133	374	4	-	-
1961	11510	5666	142	700	6	-	-
1966	13283	8848	221	928	7	-	-
1971	14865	16407	410	1313	9	-	-
1976	16329	39559	1041	2017	13	-	-
1981	17970	89868	2443	3244	18	7	85
1986	19357	137992	3646	5603	29	10	88
1987	19564	153773	4825	6355	32	12	91
1988	19788	165884	5798	7489	37	12	91
1989	20006	181936	6889	8964	44	13	92
1990	20230	195905	7285	9632	47	13	92
1991	20455	215900	8050	10170	49	13	92
1992	20655	234710	9329	11252	54	14	93
1993	20848	254276	9636	11756	56	15	93
1994	21035	279574	10556	11172	57	16	94
1995	21170	299753	11315	19120	92	16	94

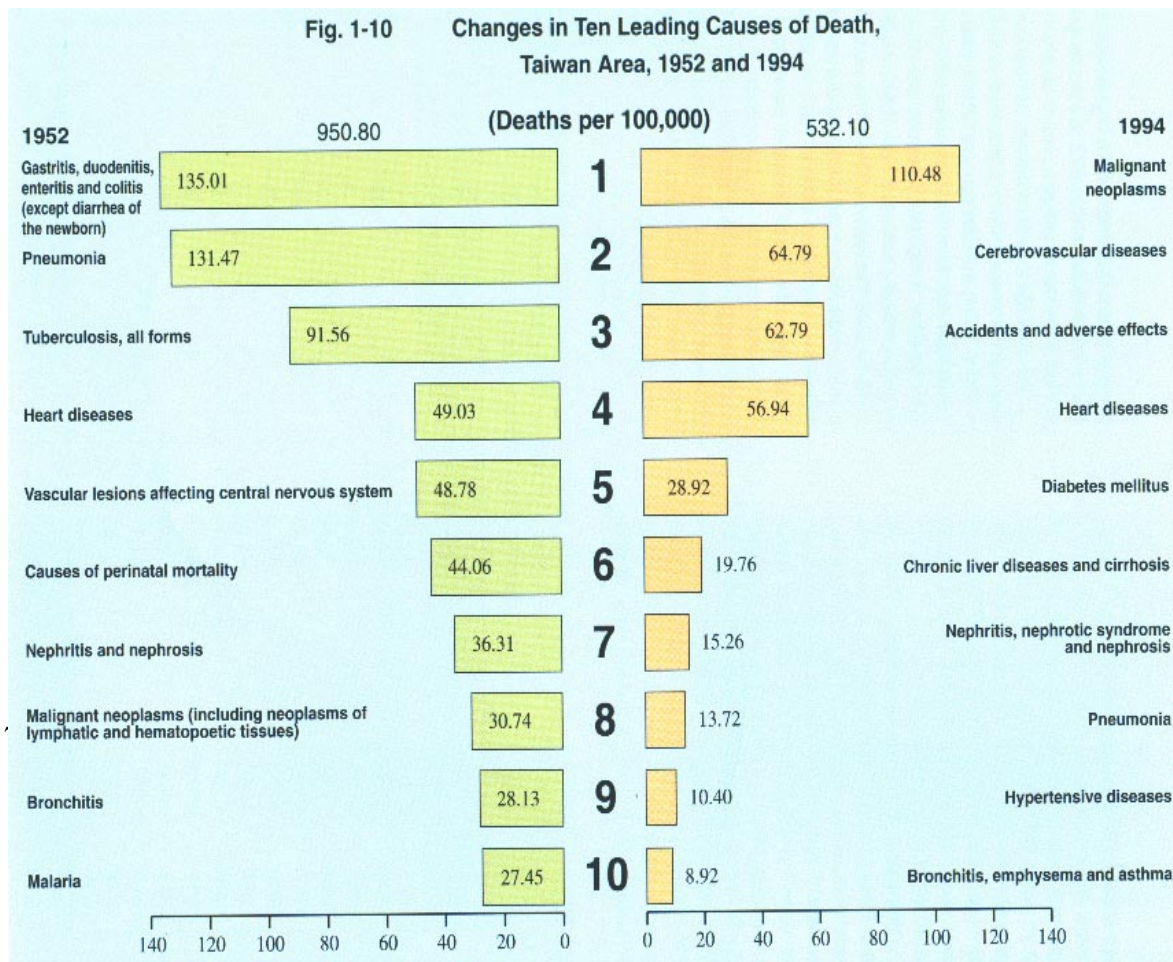
Source: Department of Health, 2000, table 1-2.

Appendix 8: Number of Beds and Physicians per 10,000 Persons

Year	No. of hospital beds	No. of practicing medical personnel	No. of practicing physicians (including Chinese medicine doctors)
1971	16.17	12.29	5.29
1976	19.87	19.60	6.96
1981	24.51	25.43	7.59
1986	41.84	35.82	9.21
1987	43.88	39.27	9.84
1988	44.50	41.72	10.34
1989	43.12	42.59	10.37
1990	43.80	44.79	10.96
1991	45.14	47.15	11.49
1992	46.30	49.62	12.03
1993	47.90	52.17	12.48
1994	48.98	53.87	12.89
1995	52.62	55.37	12.87

Source: Department of Health, 2000, table 1-3.

Appendix 9: Changes in Ten Leading Causes of Death



Source: Department of Health, 2000, figure 1-10.

Appendix 10: Co-payments for Outpatient Treatment, Inpatient Treatment and Drugs

Outpatient Co-payment Rates

Level of Service Provider	Outpatient Care	Dentistry	Chinese Medicine	Emergency
Clinic	50	50	50	150
District Hospital	50	50	50	150
Regional Hospital	100	50	50	210
Medical Center	150	50	50	420

Inpatient Co-payment Rates

Ward	O	Dentistry	Chinese Medicine	Emergency
Percentage	5%	10%	20%	30%
Acute	--	30 days or less	31 st -60 th day	61 st day and more
Chronic	30 days and less	31 st -60 th days	61 st -180 th days	181 st day and up

Drugs Co-payment Rates

Prize of drug in NT\$	Co-payment in NT\$
0-100	0
101-200	20
201-300	40
301-400	60
401-500	80
501-600	100

Source: Bureau of National Health Insurance (BNHI), 1999b, p. 13.