Thailand

Health Care Reform: Financial Management

Report 4

Proposal for a Revised Capitation Calculation and Financial Equalisation System

May 2009

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List of abbreviations

BoB	Bureau of Budget
CSMBS	Civil Servants' Medical Benefit Scheme
CPI	Consumer Price Index
DRG	Diagnosis-related groups
EU	European Union
FCF	Financial Coordination Framework
FCG	Financial Coordination Group
HCRP	Health Care Reform Project
HWS	Health and Welfare Survey
IHPP	International Health Policy Programme
ILO	International Labour Organization or International Labour Office
INFIMO	Integrated Financial Monitoring System – Common health financing model for CSMBS, IHPP, NHSO and SSO, including a Financial Cooperation Group (FCG) running and maintaining the common model and related information tools
MoC	Ministry of Commerce
MoF	Ministry of Finance
MoPH	Ministry of Public Health
MPI	Medical Price Index
NESDB	National Economic and Social Development Board
NHA	National Health Accounts
NHSO	National Health Security Office
NSO	National Statistical Office
PIU	Project Implementation Unit
PPI	Producer Price Index
SECSOC	Social Security Department of the ILO
SSO	Social Security Office
SSS	Social Security Scheme

UC   Universal Health Care Scheme

WCS   Workmen's Compensation Scheme

Reports produced under the Project

Report 1   Statistical reporting: Structures, methodologies, data and outputs. Initial review.

Report 2   The calculation of capitation fees and the estimation of provider payments. Initial review

Report 3   A Financial Coordination Framework. A first general outline

Report 4   Proposal for a Revised Capitation Calculation and Financial Equalisation System

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Foreword

Since May 2003 the European Union (EU) has been committed to supporting health care reform in Thailand through the **Health Care Reform Project** (THA/AIDCO/2002/0411). The support and assistance of EU followed Thailand's bold step towards achieving full population coverage in health care in 2001 when Universal Health Care was written into law with the introduction of what became popularly known as the "30 Baht" scheme. Under the scheme full access to health services became available to all Thai citizens.

A separate component was established within this project to address issues relating to the **Financial Management of the Health Care System**[1] which is being executed by the Social Security Department of the International Labour Office, Geneva. Technical assistance activities under the project have been on-going since spring 2006 and will continue until mid-2009.

Specific activities were scheduled under the ILO component, to be documented in a series of technical reports. *The present Report 4 concerns ILO's task of proposing a revised capitation calculation and financial equalisation system for Thailand's health system.*

Capitation can be defined as the amount of health funds to be made available to a person for health services, over a defined period, and subject to budget constraints. A capitation system puts a "price" (a "shadow fee") on the head of every covered person, i.e. it stipulates how much that person "charges to" or "costs" society in its use of health services. Capitations are usually varied according to an individual's personal and social characteristics, using a process called risk adjustment.[2]

This report addresses two core aspects of Thailand's capitation system.

First, the total average capitation amount, i.e. the "price tag" per capita of the health system beneficiaries must be calculated prospectively in order to estimate the total resources (budget) that will be made available for health care during a future period. The total prospective budget is equivalent to the average annual capitation rate multiplied by the expected number of scheme members (heads). This approach/task has been carried out in the past by NHSO and, under different conditions, by the SSO, using a variety of approaches that were not always transparent and methodologically and statistically consistent. The budget of the CSMBS, reimbursing providers on a fee-for-service basis and, thus, not capitation-based has, thus far, not been given the same amount of attention as those of the other two schemes. However, as the growth in expenditure of the CSMBS budget seems to be approaching dynamics fiscally no longer bearable, the scheme will, one way or another, have to be included in public short- to medium-term health resource planning.

Second, the resources available nationally must be allocated to providers according to patients' needs ("needs based approach to resource allocation"). Such allocation of limited monies can be considered synonymous to "financial equalisation" (as used in the title of this report) as it tries to (a) define and match patients' individual needs, (b) prevent providers from treating patients on grounds other than their individual needs, while simultaneously, (c) securing overall cost control.

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[1] EU: Financial Agreement between the European Community and the Kingdom of Thailand, Health Care Reform Project (THA/AIDCO/2002/0411), section 2.1.2 on Financial Management.

[2] Nigel Rice and Peter Smith: Approaches to Capitation and Risk Adjustment in Health Care: An International Survey. The University of York. Centre for Health Economics. October 1999.

This second aspect is more complicated to address than the global capitation estimation as:

- the health-needs indicators that would guarantee fair equalization are not always obvious and are most often the subject of controversial societal and scientific debate;

- theoretically accepted and agreed-upon indicators are not always represented adequately in statistics; and

- the use of higher statistical methods often reduces transparency; as a result of which

- limitations in public understanding of outcomes is almost inevitable.

The proposals made in this report aim (a) to provide the NHSO and the SSO with stable and consistent methods allowing for a transparent and simple estimation of global capitation rates in the future. At the core of the proposals is not so much scientific rigor but easy administrative handling and acceptance. The main benefit to be gained from carrying out the procedures involved in these proposals is that the budget planning process be understood as *a process that must be coordinated*, in cooperative administration, between the NHSO, the SSO and the CSMBS. Furthermore, the proposals aim (b) to provide health policy-makers in general, and the NHSO and SSO in particular, with a formal tool that allows for an allocation of budgeted resources that is more acceptable to providers than it has been in the past. It must be emphasised here that in the view of the ILO, any (demand-side-driven) resource allocation mechanism aiming to change the provision of health services to the Thai population can only achieve its intended purposes if the health providers (hospitals and other institutions, i.e. the supply side) are given the flexibility (autonomy) to make any necessary adjustments. In other words, any reform measures proposed will be adversely affected if a third party (e.g. MoPH) maintains autonomous control of changes to the resources and services of the health providers (hospitals and other institutions). At the time of writing of this report, in reality, Thailand's public health providers have yet to be given this autonomy.

The work required to develop the proposal for the global capitation estimation (projection) has been carried out mainly by Mr. Jean Claude Hennicot, consulting actuary, in close cooperation with the Thai government and the HCR Project Implementation Unit (PIU: Dr. Thaworn) in Bangkok, as well as with ILO Bangkok (Mr. Hiroshi Yamabana) and ILO Geneva (Mr. Wolfgang Scholz).

The core work for the resource allocation aspects, including suggestions for the development of (a) revised Thailand-specific allocation formula(e), was undertaken by external experts, Professor Roy Carr-Hill and Mr. Stephen Campbell, from the United Kingdom.[3] In agreement with the PIU, their findings have contributed to the proposals made in this report.

The report is structured as follows:

(1) In the first chapter the meaning of risk adjustment in health care finance is explained and then the main (internationally applied) possibilities of using capitation procedures are elaborated on in the context of Thailand's health system;

(2) In the second chapter, core strands of the financial set-up of Thailand's health system are explained; these are then reviewed with respect to the applicability of capitation mechanisms for the allocation of funds to providers;

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[3] The missions of Professor Carr-Hill and Mr. Campbell took place in summer 2008.

(3) In the third chapter, the procedures that have been used thus far to calculate the prospective ("closed-end") global budget for the UC scheme and the budgets for the SSO and the CSMBS are explained; this is complemented by tentative ILO proposals of how this could be done in future;

(4) The fourth chapter has the same structure as the third; its focus however is on the allocation (financial equalization) aspects of the report.

(5) The fifth chapter presents our conclusions.

1.   Risk adjustment in health care finance [4]

Capitation – a clarification

Worldwide, countries with developed health systems seek to allocate responsibility for designing and managing health care to health care 'plans', where a plan might be an insurance, a geographical area or a sickness fund. Plans organize specific types of health care for defined populations. Simultaneously, these plans are often instruments of health cost control. To this end, plans are usually subject to the requirement of fixing, prospectively, overall (maximum, closed-end) budgets that must not be exceeded without the formal consent of their respective governing bodies (boards, ministries, government, parliament, etc), thereby securing expenditure control. Expenditure control is often explicitly combined with measures aimed at securing or introducing equitable access to efficient health care services. Equity of access appears to be an important feature of national tax-financed capitation-based systems (e.g. United Kingdom, New Zealand), whereas efficiency is considered important in systems with competitive health plans (e.g. Germany, Switzerland).

Success in expenditure control varies widely. In the United States, where the bargaining power of healthcare organizations is high, cost control for health plans for the poor might be tight, while average health costs for the middle and upper classes nevertheless exceed international maximum levels. In other countries, e.g. United Kingdom, the health system's overall structure and activity level is substantially influenced by practitioners acting as gatekeepers to the system, thus simultaneously possibly limiting individual choices of patients as well as increasing their access to adequate treatment. [5]

There are various methods to address situations where there are variations of expenditure from prospective budgets:

*   re-negotiation of the initial prospective budget;

*   changing plan reserves;

*   changing contributions and/or user charges; and/or

*   rationing health care to the population at risk.

In reality, the following types of prospective budgets can be identified:

1. There is no budget: whatever costs occur will be covered. Often this is the case in systems that operate on a fee-for-service basis which, around the world, have shown

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[4] This chapter generally follows the process of argumentation of Nigel Rice and Peter Smith. For further details see their paper: Approaches to Capitation and Risk Adjustment in Health Care: An International Survey. University of York. Centre for Health Economics. October 1999.

[5] Organized mainly by the European Commission, ageing European countries have, for the past couple of years, been learning mutually from best practice. One reason for this is the fact that freedom of movement of labour increasingly requires some minimum agreement of common standards and processes among European member states. Also, the European labour markets for medical personnel are increasingly cross-border, thus mutually influencing national systems.

tendencies of high cost increases [6] and are therefore under close scrutiny in many countries. The main problem with these types of systems is that strictly positive correlations cannot be proven between the state of health of the covered populations and system costs.

2. The budget is set up under the rule that reimbursement is made for actual activity but on the basis of a set of *standard* fees and charges (e.g. by using diagnosis-related groups, "DRGs", or managed care programmes). Such approaches are aimed at avoiding unnecessary activities and might, thus, contribute to providers' cost effective behavior. There are however provider adjustment strategies, for example through "creative" coding of DRGs and other potential cost driving effects.

3. The budget is fixed. Its calculation is based on expected (projected) structure and number of activities. Providers (and patients) are aware that no monies beyond the budget will be available. [7] In other words, current activities of providers and patients have no impact on the overall budget. Adverse effects may result from negative impacts on quality of services delivered and from rationing. The prospective budget may be based on (realistic) assumptions reflecting past trends or it may be deliberately set at levels substantially deviating from such forecasts.

Internationally there is clearly a shift away from budgets set up as in (1) above, which are easy to handle administratively but where control of costs is more inherently difficult, towards budgeting approaches as in (2) and (3) above.

When examining the cost-efficiency of these various approaches to budgeting, the results are however mixed. For example, the Netherlands is funding prospectively but a complex retrospective reimbursement scheme seems to be moving the funding system back to a fee-for-service approach. Also, purchasers might negotiate closed-end budgets with providers on the basis of, for example, extrapolated past trends; however, such techniques are considered by many as arbitrary and not transparent with respect to underlying interests and/or bargaining power (issue of monopsons; monopolies).

An approach that has been used in the past few decades, with increasing methodological sophistication, is *capitation*. Etymologically, the notion is linked to the Latin word *caput* which means 'head'. Historically, the notion is linked to the introduction of poll-taxes (poll = head in ancient English) in many early democracies (United States, United Kingdom, Canada, and others) where a flat tax was levied on everyone who wished to vote, which was used mainly in order to exclude the poor and/or minorities from voting.

Also, capitation has been used in private insurance to stipulate the rate at which an insurer would charge an insured person to cover an insured risk. The rate would typically vary with the level of risk associated with the (characteristics of the) person insured (eg. car insurance).

While generally accepted under private health insurance contracts, in providing public health, the positive correlation of individuals' premiums with individuals' risk is generally not considered fair. People would for the most part not agree to public policies where those who are sick must pay a higher fee than those who are healthy. A recent case in point is the failure of a policy proposal in Germany aiming to base health revenue on a common flat capitation rate, in absolute terms equal for every insured (substituting for the income

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[6] As will be shown below, the CSMBS (Civil Servants Medical Benefits Scheme, Thailand) belongs to this category.

[7] The UC (Universal Coverage scheme), Thailand, belongs to this category.

related bi-partite contributions on labor income), which would have put a higher financial burden in relative terms on those households with low income (and probably higher sickness incidence rates).

In other words, the notion *capitation* is usually not, in public health systems, describing a method of revenue generation; in mostly all countries or health purchasing systems where capitation plays a role in health finance, the overall resources allocated to health service providers are being collected through general taxation under the principles of general taxation, or as contributions levied at equal contribution rates, as a percentage of salaries. Instead, the notion capitation is used:

(a)   as a tool (a "dummy") for the estimation of overall resources required, and

(b)   as a tool to allocate available resources to providers on the basis of risk characteristics of the covered population.

In order to achieve these ends, public health uses methods similar to those developed in private (health) insurance for determining the risk-adjusted contributions to be collected from the insured under private insurance. _Capitation rates_ in public health may conceptually be called _shadow-contribution rates_, the shadows being cast, so to speak, by risk-adjusted contribution rates (or "fees" as calculated by private health insurance).

Accordingly, *a capitation can be defined as the amount of health service resources to be assigned to a covered person that has certain characteristics, for the service and period in question, subject to an overall budget constraint.*

Risk adjustment seeks an unbiased estimate of the expected relative costs of that person to the health plan, taking into account the person's health-relevant characteristics. This remains so even if the overall budget (overall capitation) is set at (too) low (possibly unrealistic) levels. [8]

The purpose of a capitation is to ensure that plans receive the same level of resources for people in "equal need for health care", regardless of those persons' extraneous circumstances such as income or residence.

A capitation can be rudimentary, as in Spain (in the 1990s) and in Thailand's UC and SSO schemes. Age and sex are important determinants in utilization and, thus, in expenditure variations, but there are most likely other risk adjusters. The various attempts that have been undertaken to incorporate such other factors have often been constrained by the availability of data. [9]

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[8] Nigel Rice and Peter Smith: Approaches to Capitation and Risk Adjustment in Health Care: An International Survey. University of York. Centre for Health Economics. October 1999, p.2.

[9] As of 2009 Germany will introduce a system that bases (1) revenue collection on a common contribution rate of 15.5 per cent (applicable to earnings up to a defined ceiling) and (2) allocation of resources to purchasers on risk adjusted capitation. Risk adjustment takes into account sex, age, and morbidity with respect to 80 defined diseases (diagnoses). See: International Labour Office: The Social Budget of Germany in International Perspective. ILO research project co-financed by the German Federation of Trade Unions (Deutscher Gewerkschaftsbund, DGB) and Hans-Boeckler Foundation (Hans-Böckler-Stiftung, HBS), Germany Project number: 2006-820-4. Geneva 2009 (forthcoming).

Setting capitation rates

Assuming the global amount of money available has been (prospectively) fixed (the way this is being done in Thailand is explained in Chapter 3), the question arises as to how to fix capitation rates such that allocation of those funds to available services guarantees scheme members' equitable access. In order to solve the problem, one needs a set of theoretically and statistically significant factors ("needs factors") as well as methods that allow for transformation of those factors into risk-adjusted capitations.

Singling out the needs factors can be done two ways:

(a) by judgment – i.e. normative, and

(b) by applying statistical inference methods that allow the determination of factors that best explain actual past expenditure development – i.e. empirical.

Under the normative approach, needs factors are selected on the basis of epidemiological and other scientific evidence. Under the empirical approach, needs factors are selected on the basis of a proven correlation with health care spending. [10, 11]

In either method of selecting the needs factors, there is the possibility of missing unmet needs. These unmet needs can be general and specific. *General unmet needs* are defined as a situation where the population at large is provided with only inadequate services. There are *specific unmet needs* when particular groups within the overall covered population (e.g. those living in rural areas) are not receiving the services to which they are considered entitled in comparison with other groups or the total population. In circumstances of obvious discrimination among groups, the use of empirical methods of fixing the capitations is problematic as it may perpetuate existing inequalities. Even if "correct" capitations were empirically found, a subsequent re-allocation of purchasers' resources towards those discriminated against does not necessarily reduce discrimination if it is a result of inadequate health infrastructure (providers; supply side).

These considerations are important for setting capitation rates in Thailand as there is evidence of insufficient general resources as well as discrimination. Discrimination appears to occur within scheme membership, but becomes more evident when comparing the different schemes (UC versus SSO versus CSMBS). [12]

Both methods of selecting needs factors, judgmental and empirical, must relate to statistical information. The selection of statistics is itself of a political nature. Against this

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[10] It should be recalled that statistical inference methods (e.g. regression analysis) is usually required to be theory-based, i.e. a theoretical model must exist before any significant correlation coefficient is considered (preliminarily) acceptable.

[11] The terms of reference of the financial management component of the HCRP stipulate that an allocation formula ("equalisation system") be developed reflecting "special risk factors and/or infrastructural idiosyncrasies". The same terms of reference also stipulate the development of a capitation system using "key epidemiological, utilization and demographic data". This report makes a proposal as to how these rather unspecific stipulations should be interpreted and whether Thailand should follow a normative, an empirical or a hybrid approach in its capitation-setting procedures.

[12] Currently, CSMBS on average spends between around 8 to 10 times as much per member as the UC scheme. There are indications, however, that some of the CSMBS' "overshooting" charges are being used by providers (hospitals) in order to cross-subsidize treatments of (underfunded) UC members. Accordingly, discrimination against UC members would be effectively reduced to the extent such cross-subsidization takes place.

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background, it is important to note that, ideally, the personal factors on which risk adjustment ought to be based must only incorporate characteristics that are:

- universally recorded;

- statistically and methodologically consistent;

- verifiable (in practice and in principle);

- free from perverse incentives;

- not vulnerable to manipulation;

- consistent with confidentiality requirements; and, last but not least,

- plausible determinants of health services needs.

The political context decides as to whether providers' input prices (labor costs, non-labor costs) should play a role in the setting and adjusting of capitations. Allowing input prices to play a role offers providers influence on capitation setting and capitation development over time; however, not allowing for the impact of input prices may turn out unrealistic. [13]

International experience shows that the processes of selecting needs factors are complex. The following reasons have been mentioned: [14]

- Required data are missing;

- Scientific evidence on needs factors is limited and inconclusive with respect to capitation results;

- Covariance between needs factors cannot be handled (the "independence" issue);

- Agreeing on the legitimacy of selected needs factors is often highly controversial;

- Establishing the costs of a needs factor is often very difficult;

- Providers tend to influence the choice of needs factors.

Once needs factors have been identified, weights must be attached to them which reflect their relative influence on the need to spend.

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[13] Internationally, there seem to be various approaches to this problem; however, allowing for (some) input price development is not a matter of exemption. See: Nigel Rice and Peter Smith: Approaches to Capitation and Risk Adjustment in Health Care: An International Survey. University of York. Centre for Health Economics. October 1999; p.7. The cases of United Kingdom, United States, Belgium.

[14] Nigel Rice and Peter Smith: Approaches to Capitation and Risk Adjustment in Health Care: An International Survey. University of York. Centre for Health Economics. October 1999; p.8.

Needs factors included in capitation – international findings

An international survey of 19 countries, undertaken by Rice & Smith, shows that the following factors are being taken into account by the various schemes: [15]

- *Demography* (population structure: age, sex) – all schemes, except two;

- *Ethnicity* – several schemes (e.g. New South Wales, New Zealand, Alberta, Stockholm);

- *Employability/disability* – several schemes (e.g. Netherlands, United States, New Zealand, Alberta, Northern Ireland);

- *Geographical location* – several schemes (e.g. United States, Netherlands, Belgium);

- *Morbidity and mortality* – several schemes (New South Wales, Belgium, Wales, Scotland, Northern Ireland, Italy, New Zealand, Norway, Finland, Netherlands, United States, Stockholm);

- *Social factors* – these comprise: homelessness and education (New South Wales); unemployment (Belgium, Netherlands, Stockholm); welfare status (Alberta, New Zealand, Northern Ireland); marital status (Norway, Stockholm); family structure (France, Norway); housing quality (Belgium); housing tenure (Stockholm); social class (Stockholm); cohabitation (Stockholm, Northern Ireland); income (Finland).

Capitation – the matrix

In practice, a matrix approach is the logical mathematical tool for dealing with capitations. The identified needs factors (e.g. age, sex, ethnicity, employment status, etc.) are used to create a grid of capitations in which each entry represents the expected annual health care costs of a scheme member, or a citizen, with the associated characteristic.

Example: The matrix-approach to capitation

Age group	Ethnicity 1				Ethnicity 2				Ethnicity 3			
	male		female		male		female		male		female	
	disab 1	disab 2	disab 1	disab 2	disab 1	disab 2	disab 1	disab 2	disab 1	disab 2	disab 1	disab 2
1	X	X	X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X	X	X	X	X	X
3	X	X	X	X	X	X	X	X	X	X	X	X
4	X	X	X	X	X	X	X	X	X	X	X	X
5	X	X	X	X	X	X	X	X	X	X	X	X
6	X	X	X	X	X	X	X	X	X	X	X	X
7	X	X	X	X	X	X	X	X	X	X	X	X
8	X	X	X	X	X	X	X	X	X	X	X	X

The example distinguishes eight age groups, 2 sexes, 2 disability stages, 3 ethnicities => 8 * 2 * 2 * 3 = 96 capitations, where *X* indicates entries for capitations.

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[15] Nigel Rice and Peter Smith: Approaches to Capitation and Risk Adjustment in Health Care: An International Survey. University of York. Centre for Health Economics. October 1999. pp.13-15; 22-24.

The Netherlands uses 19 age groups, 2 sexes, 5 urbanizations and 5 employability stages => 19 * 2 * 5 * 5 = 950 capitations, which, in practice, are reduced to (still impressive) 380. [16]

Alternatively, some countries have been using *index approaches* mainly due to the fact that no individual data are available. Index approaches try to estimate the aggregate spending needs of a population, based on their pre-defined characteristics, which might comprise demography, mortality, population density, unemployment rate, proportion of disabled, housing quality and others. For example, in Belgium a Royal Decree stipulates that the following criteria might be taken into account as explanatory variables in the construction of formulae explaining (forecasting) expenditure (dependent variable) of the five mutualities performing as purchasers in the country:

• the social and professional circumstances of a fund member;

• the number of survivors;

• the number of disabled members;

• the number of pensioners;

• the number of poor members;

• demographic factors;

• mortality rates;

• degree of urbanization;

• unemployment rates;

• household consumption, and/or

• revenue,

(each explanatory variable being specific to the mutuality under consideration.)

Out of the above list, in the late 1990s the following variables were actually being used as explanatory variables in a regression formula developed for projecting (budgeting) specific expenditure components of the mutualities: [17]

• proportion of women;

• proportion aged 40 to 99;

• proportion of unemployed;

• proportion working in public sector;

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[16] Under the new German system, implemented as of 2009, a total maximum number of 100 (single ages) * 2 (sexes) * 80 (diseases) = 16,000 capitations would be calculated; at the time of drafting this report it was unknown to which amount that number is being reduced in practice.

[17] For more details see Nigel Rice and Peter Smith: Approaches to Capitation and Risk Adjustment in Health Care: An International Survey. University of York. Centre for Health Economics. October 1999. p.31.

- crude mortality rate;

- proportion disabled;

- density (urbanization); and

- housing quality.

The main theoretical (and empirical) problem with the index approach seems to be *ecological fallacy* which means that factors that might have proven significant at an aggregate level fail to do so at individual scheme member level.

Capitation – a caveat

The limitations of capitation, no matter what level of sophistication it is based upon, should be acknowledged. Estimates indicate that only about 20 per cent of health expenditure variation can be explained by selected cost drivers. The remaining 80 per cent is subject to unknown factors; major gains in explanatory power have been achieved only by incorporating variables from *within* the health system, i.e. by variables that are, in principle, under the system's control [18] and, thus, "alien" to the purpose of cost control under capitation systems.

Capitation - the Thai context

The implementation of capitation in Thailand from a pure "health needs" (demand based) conceptual viewpoint as outlined in this chapter is premature for a number of reasons:

1. Needs-based capitation concepts have been developed in countries with relatively equal societal living conditions or where there is strong political consensus that such conditions should be strived for. The concepts were meant to address growing cost (financing) problems of highly utilized (possibly over-utilized) systems in affluent societies while, at the same time maintaining and, if possible, even improving the health of the populations through better access to health services – e.g. by reducing access-imbalances between and among groups;

2. Conceptually, needs-based capitation attaches different price tags to the different covered persons indicating the persons' individual (average) "entitlement to health resources". The "pricing" is done on the basis of the needs of that person where the estimation of those needs (estimation of the persons' share in the overall health resources available = the "price", the capitation) is based on personal characteristics that are *independent* from the health provider system's influence. If providers are able to influence the prevalence of those characteristics, this will have a negative effect on the cost-control and quality improvement aspects of capitation. This approach requires an abundance of two-dimensional statistical information, in principle at the individual level, but also at the system level.

3. The implementation of needs-based capitation concepts does not, in principle, require a health organization/administration to operate under one single national authority, although such a set-up might benefit from economies of scale. There exist situations where cooperation between equal-level institutions function well, however usually a

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[18] Nigel Rice and Peter Smith: Approaches to Capitation and Risk Adjustment in Health Care: An International Survey. University of York. Centre for Health Economics. October 1999. p.8.

condition *sine qua non* of capitation is the existence of legislation stipulating, and public (semi-public) health administrations enforcing, a common health services package to each inhabitant, independent of status or income or other characteristics that are incompatible with the needs-based concept.

For the time being, all of the above aspects render it difficult to pursue a pure needs-based capitation strategy in Thailand for the following reasons:

Firstly, Thailand is a middle-income country, not an affluent society, with (still) low utilization of its comparatively good, but in comparison to those "mature capitation countries", still underdeveloped health system; only a few people have material access to the "doctor around the corner".

Secondly, statistical information required to run a needs-based capitation system on a continued administrative basis is only slowly developing, if at all. There is increasing amounts of information available within the three purchasing institutions (CSMBS, NHSO, SSO) but this information mainly serves the purpose of short-term delivery of services to the scheme members. The information is considered useful as long as it supports services delivery, but it is "forgotten" and replaced by new information once the next cycle (day) of service delivery starts. A statistical system representing Thailand's (health system's) long-term "memory" on the basis of formal rules of compilation and publication and required for taking strategic resource allocation decisions on an objective quantitative basis, has yet to evolve. To the extent that detailed individual information is increasingly available, it is predominantly information on patients' direct health characteristics and their use of health services, or other information that has been generated by the provider system (supply side). Some extra-health system statistics are being compiled on a regular basis, however, by the Statistics Office (e.g. the regular Health and Welfare Survey).

Creating a sufficient statistical information system required for implementing a rational needs-based policy approach would not, alone, adequately address Thailand's current health system problems. [19] The reason is that there is an obvious need to improve the supply side of Thailand's health system, and such an improvement is necessary independent of the issue of the adequacy of provider payment systems. This need to improve health care supply implies that purchaser resource allocation cannot, conceptually, be based solely on individual health needs but also has to take into account gaps in the supply of (health) labour and (health) capital. Further, this implies that public providers (hospitals) must legally be given more budget and staffing independence while, at the same time, being subjected (including private providers) to tight supervisory mechanisms of service quality improvements and maintenance.

Thirdly, the concept of an equal minimum package (including equal access thereto) is not yet fully established. The main indicator for this observation is the wide gap in spending per capita of the CSMBS in comparison to the UC and the SSS. Therefore assuming the informational problems were solved, any strategy towards a nation-wide Thai capitation system would have to cope with, and probably accept, a long transitory period, and the existence of parallel systems. There is reason, however, to believe that the SSO and the UC could develop a common system – which does not, in principle, and not automatically, imply equalization of capitation rates.

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[19] It should be noted that information systems in mature "capitation countries" are often sub-optimal, as well.

2.   The financial setting of Thailand's health system

The most informative overview of the financial fabric of Thailand's health system is provided by the Thai National Health Accounts (NHAs).[20] Table 1 provides an overview of magnitudes.

Table 1.   Expenditure of Health Financing Agencies, Thailand, National Health Accounts 1994 to 2008

Financing Agency	1994	1995	2000	2001	2002	2003	2004	2005	2006p	2007p	2008s
Million Baht											
Min of Public Health	34,475	42,124	54,960	53,068	49,144	47,384	53,165	47,077	46,800	46,800	46,900
Other Ministries	4,460	7,128	4,825	3,777	6,507	7,999	6,535	7,998	8,350	8,600	8,900
Local Governments	1,815	2,267	5,620	5,952	6,549	12,384	8,007	8,902	11,270	13,400	16,100
State Enterprises	2,478	1,793	2,461	2,577	2,632	2,629	2,630	2,674	2,800	2,880	3,000
CSMBS	9,954	11,156	17,058	19,131	20,476	22,686	26,043	29,380	37,000	46,480	55,200
SSO	3,286	4,418	8,367	10,752	10,684	24,858	14,253	19,123	21,800	23,000	26,900
UC		30,344	32,445	34,161	42,254	54,990	68,830	78,100			
WCF	416	522	483	521	512	1,200	618	625	660	700	700
Public Agencies	*56,885*	*69,407*	*93,774*	*95,779*	*126,850*	*151,584*	*145,412*	*158,033*	*183,670*	*210,700*	*235,900*
Private Insurance	2,234	3,122	5,023	5,346	5,882	6,779	7,557	8,221	9,360	10,270	11,400
Traffic Insurance	3,007	3,503	4,339	4,777	5,114	5,227	5,618	5,711	6,030	6,270	6,600
Employer Benefits	7,946	7,864	6,638	6,969	6,602	6,567	6,009	5,878	5,740	5,650	5,600
Private Households	56,766	62,957	56,362	56,286	54,854	56,909	59,485	68,548	71,330	73,360	75,800
Non-profit Instit.s	664	895	939	859	897	942	1,001	1,092	1,160	1,210	1,300
Rest of the World	154	89	72	187	568	914	569	597	600	600	600
Private Agencies	*70,771*	*78,430*	*73,372*	*74,424*	*73,917*	*77,339*	*80,240*	*90,046*	*94,210*	*97,360*	*101,100*
All Agencies	*127,655*	*147,837*	*167,147*	*170,203*	*200,768*	*228,923*	*225,652*	*248,079*	*277,880*	*308,070*	*337,000*
Billion Baht											
GDP (current prices)	3,165.2	3,629.3	4,637.1	4,922.7	5,133.5	5,450.6	5,917.4	6,489.8	7,087.7	7,816.5	8,383.0
Per cent											
All Agencies in per cent of GDP	4.0	4.1	3.6	3.5	3.9	4.2	3.8	3.8	3.9	3.9	4.0

Source: 1994-2005: IHPP; 2006-2007: Partially ILO estimates (November 2007); 2008: Partially ILO projections (November 2007). All figures 2006-2008 based on ILO model calculations and on information provided by NHSO, SSO, CSMBS and Ministry of Finance (Fiscal Policy Department).

p: preliminary/estimate. s: estimate/model projection. Sum-inconsistencies due to rounding. X- rate (February 2008): 1 € = 47 Baht.

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[20] See: Thailand: National Health Accounts 1994 to 2005. Data as provided in 2007/2008 by the International Health Policy Program (IHPP), Thailand, in electronic format to ILO.

In 2008, all Thai health financing agencies together are expected to spend about 337 billion Baht (around 7.2 billion Euro, 10.8 billion USD) on health care services. This amounts to about 5270 Baht per capita of the population (112 €, 168 USD). In relation to Thailand's overall income produced (GDP), those expenditures amount to around four per cent.

After the 1997/1998 financial crisis had temporarily reduced relative health spending levels, the country is now back, in relative terms, to the levels spent during the first half of the 1990s (see below).

When looking at the period since the early 1990s, there were two main events shaping the overall development and structure of Thailand's health system: (a) the financial and economic crisis of 1997/1998, and (b) the implementation of the UC scheme in 2002. [21]

The impact of the crisis can be seen by analyzing the finance agencies' expenditure elasticities with respect to nominal GDP growth. The analysis was based on observed rates of expenditure elasticity from 1995 to 2007, including (partially) estimates for 2006 and 2007 (see footnotes of Table 1) and *excluding* administration costs and capital formation. Theoretical elasticities were filtered out using standard parameter estimation techniques and expert judgment. The result is documented in Table 2.

Table 2.   Health Financing Agencies' Spending Elasticities 1995 to 2007; estimates

Financing Agency	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
						Elasticities							
MoPH			2.55						-0.06				
OthMin			3.56				10.11				0.42		
LocGovt			3.07						2.59				
StateEnterprise			2.67						0.44				
CSMBS			2.33							2.07			
SSO			2.53						2.18				
UC											2.29		
WCF			5.78						0.56				
PrivIns			6.07						1.34				
TrafficIns			1.63						0.55				
ERBenefits			-0.03						-0.22				
PrivHH			1.71						0.39				
NonProfit				1.13							0.58		
RoW			9.59				27.50				-0.04		

Source: Table 1; ILO estimates.

MoPH =Ministry of Public Health (public). OthMin = Other ministries (public). StateEnterprise = State Enterprises (public). CSMBS = Civil Servants Medical Benefits Scheme (public). SSO = Social Security Scheme (public). UC = Universal Coverage Scheme (NHSO) (public). WCF = Workmen Compensation Fund (public). PrivIns = Private health insurance (private). TrafficIns = Traffic accidents insurance (private). ERBenefits = Employer sponsored health benefits (private). PrivHH = Private households' disposable income spent on health (private). NonProfit = Health purchase financed by non-profit organisations (private). RoW = Health purchase financed by non-resident institutions (private).

Visual presentation of the results of Table 2 is given in the following Charts 1 and 2.

[21] In a historical perspective one might speculate that "event b" has been the consequence of "event a", but such analysis is beyond the scope of this report.

Chart 1. Public Health Financing Agencies' Spending Elasticities 1995 to 2007

Elasticities Expenditure Public Health Financing Agencies
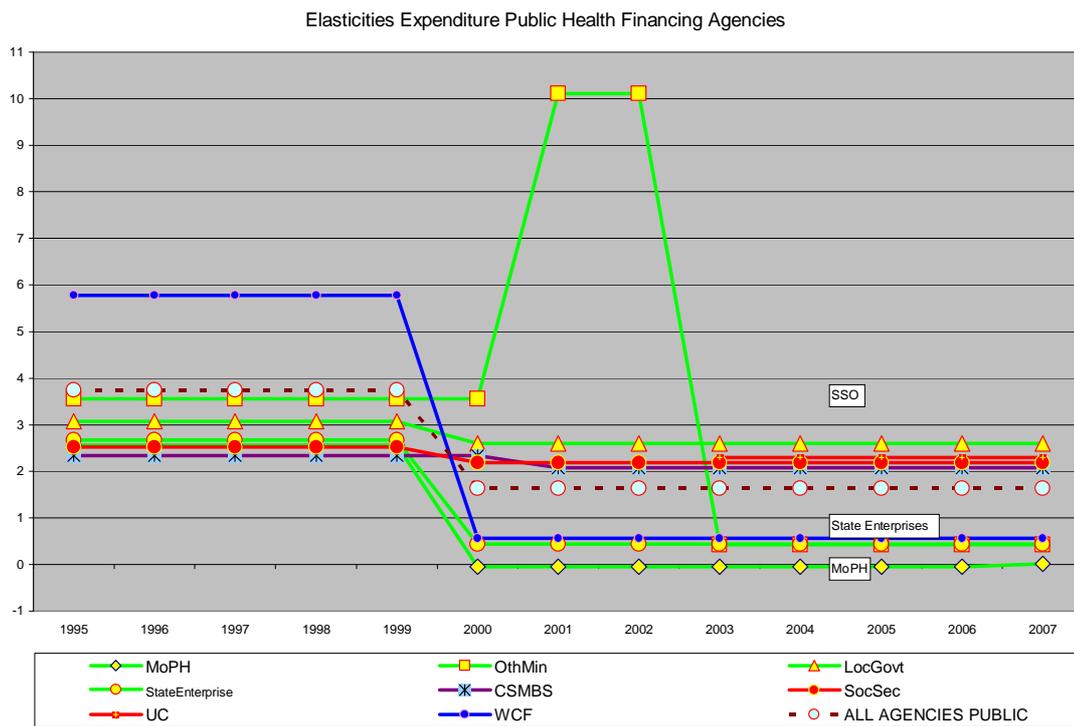
Source: Table 2.

Chart 2. Private Health Financing Agencies' Spending Elasticities 1995 to 2007

Elasticities Expenditure Private Health Financing Agencies (excl. RoW)
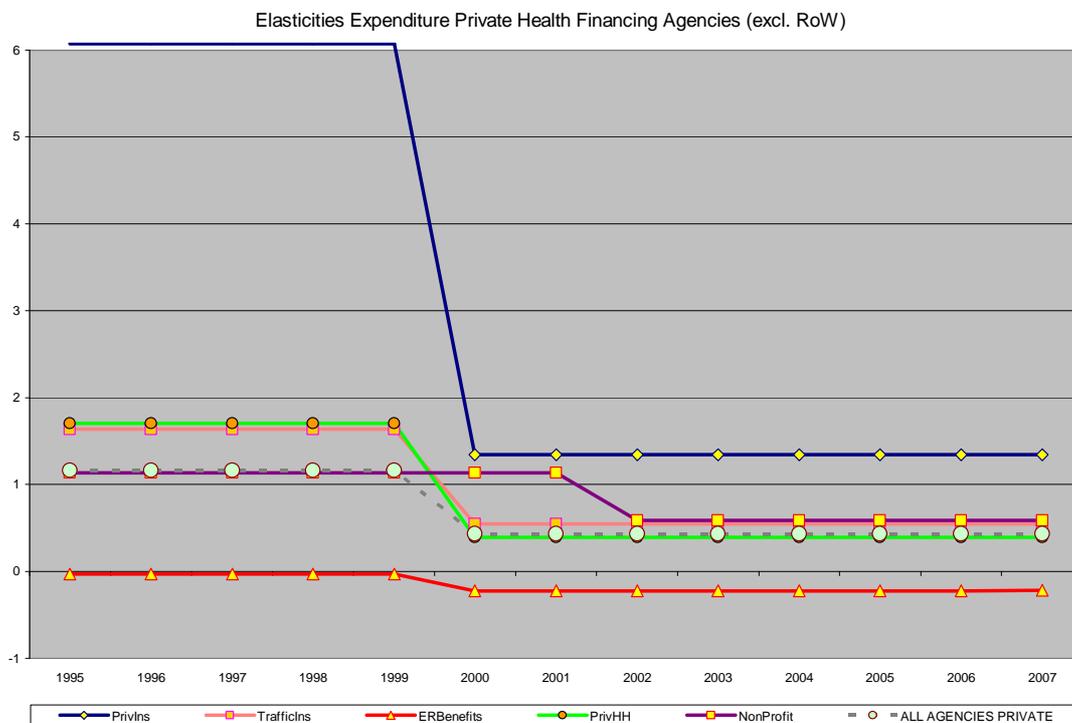
Source: Table 2.

As Chart 1 shows, virtually all government-controlled institutions (including WCF and SSO) decreased their health spending *dynamics* after 1999 quite substantially, which, taking into account administrative recognition and implementation lags, can be interpreted as the overall post-financial crisis policies of the government. The only institutions temporarily counterbalancing this change in spending were *other ministries*. Later in 2002, these developments were complemented by the implementation of the UC scheme. Spending elasticity of the UC has, thus far, averaged slightly above 2; the high dynamics is owed to the "catch up process" with respect to overall funds to be made available by the government, which, initially (in 2002), were (set far too) low, and to the fact that the MoPH is reducing its relative financing shares while the UC is increasing its own.

With respect to the private financing agencies, Chart 2 shows the reduction of the spending dynamics of private households in the aftermath of the financial crisis. Private households are by far the main private purchasers (see below). Private health insurance and private non-profit organizations also reduced their spending dynamics. In both cases this might be related to crisis-induced reductions in institutions' capacities to collect revenue (contributions; donations). The fact that (private) employer-sponsored health financing has been permanently decreasing (negative average elasticities imply that whenever nominal GDP *increases*, which has over the observed time span been usually the case, private employer spending on health *decreases*) may be explained, in general, by the spending elasticities of the public sector, which on average have always been significantly above 1, and, in detail, by the implementation and continued coverage expansion of the SSO, requiring participation, through contribution payments to the SSO, of growing numbers of employers. Chart 2 excludes the elasticities for RoW [22] as these were historically very high and especially volatile in the aftermath of the financial crisis (Table 2).

Chart 3 shows the structural changes in the financing of Thailand's health system since 1994. It can be observed that, in relative terms, out-of-pocket payments of private households, as well as direct financing through ministries, are decreasing while payments of the semi-public institutions UC and SSO are increasing. With some caution, one might add the CSMBS to the group of public institutions which, methodologically, could be itemized as public employer sponsored benefit.

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[22] Rest of the world.

Chart 3.   Financing Agency Weights in the Overall Health System of Thailand

Relative Expenditure Share of Financing Agencies - Long-term Trends
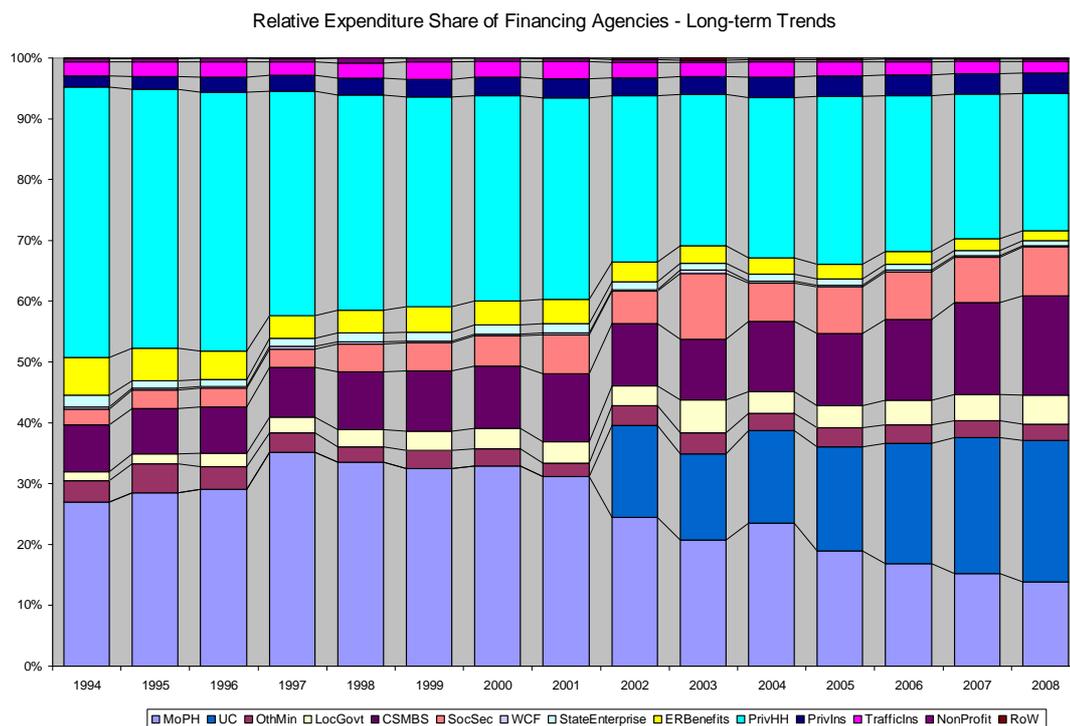
Source: Table 1.

MoPH = Ministry of Public Health (public). OthMin = Other ministries (public). StateEnterprise = State Enterprises (public). CSMBS = Civil Servants Medical Benefits Scheme (public). SSO = Social Security Scheme (public). UC = Universal Coverage Scheme (NHSO) (public). WCF = Workmen Compensation Fund (public). PrivIns = Private health insurance (private). TrafficIns = Traffic accidents insurance (private). ERBenefits = Employer sponsored health benefits (private). PrivHH = Private households' disposable income spent on health (private). NonProfit = Health purchase financed by non-profit organisations (private). RoW = Health purchase financed by non-resident institutions (private).

Chart 4 shows an extrapolation over the long run of the expenditure dynamics of Thailand's health system as observed since after the financial crisis. It should be stressed that such extrapolation is not a forecast but only a graphical tool that helps to better perceive the underlying dynamics of the trends of the past decade (mechanic "what-if-calculations").

Chart 4. **Model extrapolation of National Health Accounts – impact on financing agencies' relative contribution to overall resources**
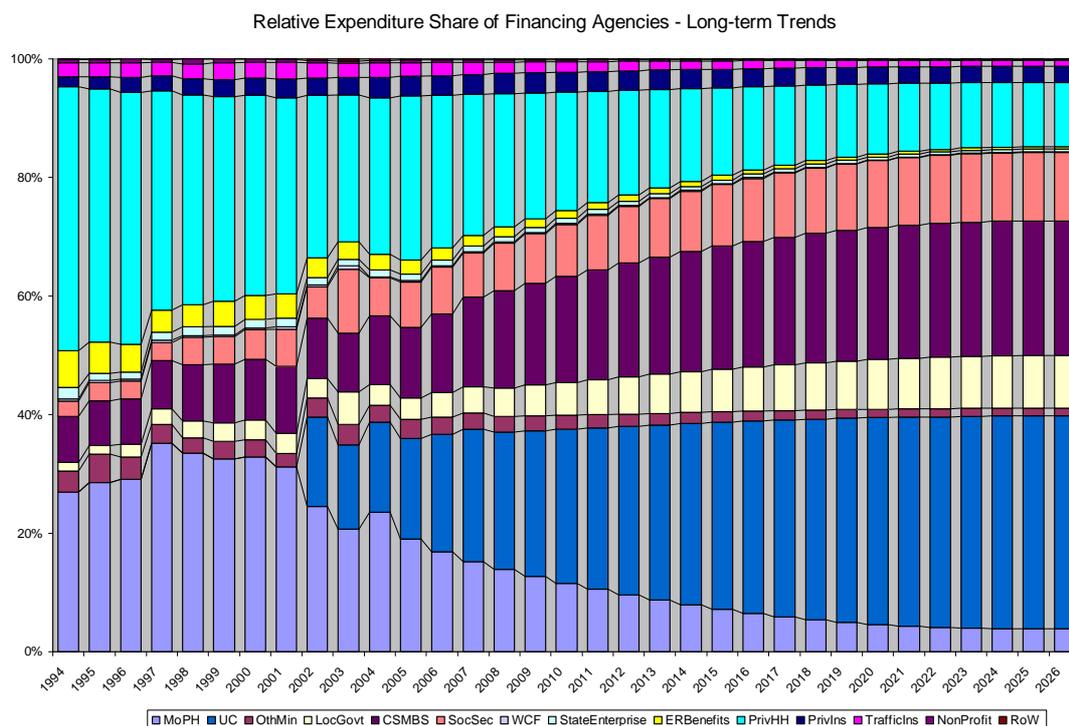
Relative Expenditure Share of Financing Agencies - Long-term Trends

Source: ILO trend extrapolations; no forecast (see text). Steady state assumed to be reached in 2026; steady state defined as: elasticities of all financing institutions converge towards unity (1).

Chart 4 clearly depicts the policy challenges approaching the public health financing agencies (mainly the CSMBS, NHSO, SSO), and Thai health policies in general. As the financial share in the overall "cake" increases, this implies an increasing responsibility for the (proper functioning of) the health system. Thailand's public health financing agencies have still not addressed this imbalance. While moving towards a higher financial share, the simultaneously emerging responsibility for the population's health needs is, for the time being, not well coordinated among the three main agencies. This non-coordination has an effect on areas such as benefit packages, budget planning, provider supervision (control of service quality and delivery and financial control) and provider payment mechanisms. The main reason for this difficulty in coordination among the institutions is a different understanding of the role that the institutions ought to play in health policies. While the NHSO understands its own role of a health-managing institution, the SSO is predominantly performing as a cost-minimizing purchaser, whereas CSMBS acts essentially as a (cash) clearing house between providers and members.

While improving health-system performance requires changes in the perception of the roles that the financing agencies have to play, taking on higher responsibilities will not be possible without a number of structural changes to the present set-up on the provider side. Most importantly, public hospitals will have to be given (greater) independence from MoPH with respect to service packages, staffing and investments, not only in order to be able to maintain the population's trust in public health provisions in an environment of growing competition with private clinics, but also in order to be able to react to any changes in payment mechanisms induced by the public purchasers.

The same model trend extrapolations result in a long-term increase of Thailand's health sector in GDP (Chart 5). While the results do not seem by any means dramatic, they imply equal, if not even faster, increases in health (provider) resources, i.e. supply side measures.

These include investments in infrastructure (hospitals, care centers, etc.) but also in labor, i.e. staffing (doctors, nurses, pharmacists, technical staff, and support staff) and their education.

Chart 5.   Model extrapolation of National Health Accounts – impact on financing agencies' relative share in GDP
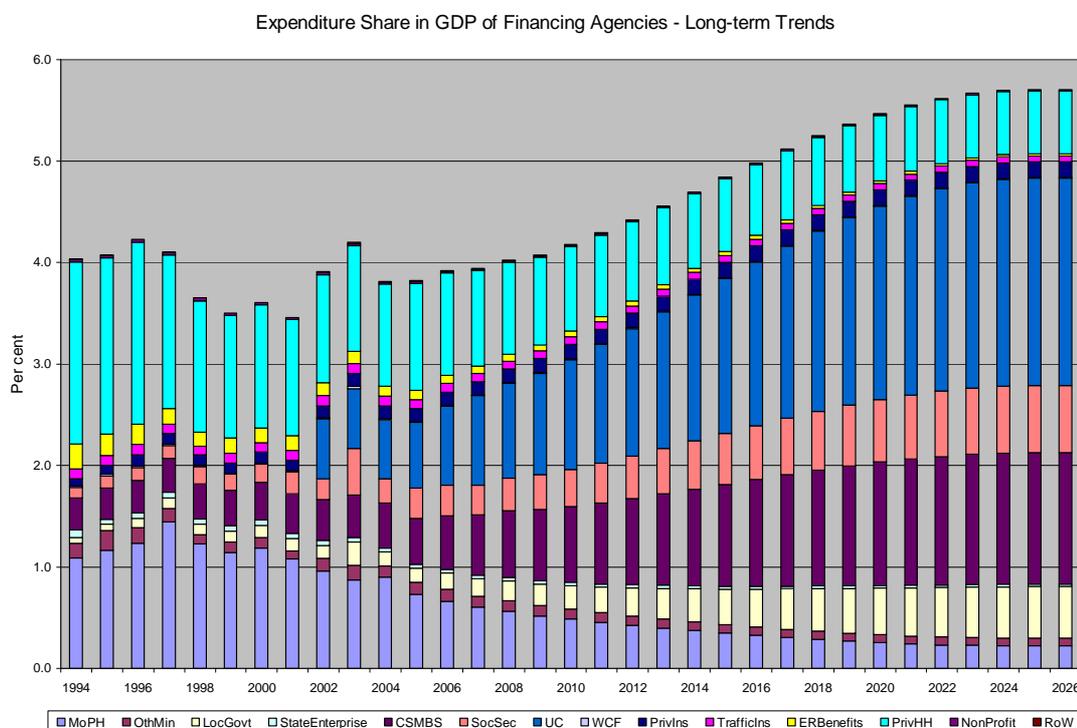
Expenditure Share in GDP of Financing Agencies - Long-term Trends

Source: ILO trend extrapolations; no forecast (see text). Steady state assumed to be reached in 2026; steady state defined as: elasticities of all financing institutions converge towards unity (1).

While the abovementioned problems must be solved in the longer run, a more immediate problem has occurred since the expansion of the SSO and the implementation of the UC. A number of providers (public hospitals) have had reason to complain about under-funding through the SSO and the UC. Although there appears to be less tension between the UC and some of the public hospitals, there remains an unhealthy amount between the SSO and a different set of hospitals with whom they have partially contracted.

Given this background, within the context of the HCRP, a practical solution needs to be found to satisfy the funding needs of all stakeholders involved in a fair and equitable manner.

The practical solution sought will have to make sense, however, in a wider health policy context. In other words, it is necessary to make practical proposals to overcome the pressure on the provider side, which could be part of a broader resource allocation policy ("capitation policy") that might emerge in the future and include the CSMBS, NHSO and SSO in a coordinated and cooperative way.

The practical proposal made in this paper (see below) is a first attempt to find such a solution. Given the abovementioned resource allocation problems, the practical proposal also includes a description of a wider capitation policy open to be pursued later which integrates the practical proposals, and which together help to overcome the allocation problems of the immediate past and the near future.

3.   Estimating the global budgets [23]

Estimating (projecting and planning) the global budgets is understood here to be synonymous with projecting, under the SSO and NHSO, the global capitation rates and the number of members to which the capitation rates relate. Multiplying the number of members to the capitation rates, while estimating separately any add-ons (i.e. extra capitation), produces the total budget available. In the CSMBS, the situation is different, as the scheme pays on a fee-for-service basis, and therefore a payment mechanism leaving budget development to the behaviour of patients and providers differs from the other two schemes and will therefore require a different budgeting approach.

Budgeting in the SSO

The health branch of SSO started its operations in 1991. Before the scheme could be implemented, decisions had to be taken with respect to the payment mechanism. At that time, Thailand was economically much less developed than it is today; therefore the government's main goal was to secure financial control over the new scheme and not to pursue overly-ambitious health policy goals. A fee-for-service based system could clearly have increased (too) low utilization rates of the SSO's covered population, but was considered potentially too costly. Thus, a decision was taken in favor of capitation, and the rate was initially set at 700 Baht per member per year. This rate was paid to the hospitals (providers) under which the scheme members had registered, with no reference to the frequency (per year) by which the members would make use of provider services.

On the background of the considerations made in Chapter 1 (risk adjustment in health care finance), the setting of an identical rate for every member implied and assumed an equal need of the health services system among all individual SSO members, i.e. equal risk (probability). This assumption is, of course, extremely unlikely to be exact. Even if it were so, the assumption further implied equal access of scheme members to a readily available system, more or less homogenous in terms of types, quantity and quality of services offered. It was possibly an awareness of this shortcoming which, from the outset, provided SSO members with the facility and opportunity to choose – and change – their hospital (provider) registration as they pleased.

Although at that time the approach was flawed under theoretical considerations, it was most likely the best that could have been done, given the lack of information about individuals' characteristics.

As the scheme evolved over time, covering more and more members and contracting with an increasing number of public and private hospitals, inconsistencies in the system's founding principles became evident in the form of recurrent conflicts with (parts of) the provider side complaining about under-funding. One of the main criticisms was that members' annual utilization of services varied substantially with hospital type (while the latter were all receiving identical annual capitation per SSO member registered). In other words, certain hospitals were incurring high costs through frequent usage of their resources

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[23] The financial management component of the project document requires the global budget projection to be based on "key epidemiological, utilization and demographic data in provincial and sub-district levels". This requirement is obviously irrelevant for the global budget estimation, which, at the time of drafting of this report, has been clarified with the project's Thai counterparts. Those data may play a role in the allocation formula to be developed separately, see below.

by SSO-covered patients while others incurred low costs because SSO-covered patients were tending to avoid them (see Charts 6 and 7). [24]

The SSO's main reaction was to complement the capitation rate by an increasing number of "add-ons", while leaving the standard capitation rate constant over long periods (no indexation of the rate, e.g., to accommodate for provider cost inflation). Table 3 gives an overview of the long-term development of capitation under SSO.

Chart 6.   SSO - frequency distribution of average out-patient utilization rates across service providers, 2006

Table A.1. Average OP utilisation rate (contacts/year) across SSO providers, 2006

Mean: 2.48   Std. dev.: 1.00   COV: 0.405
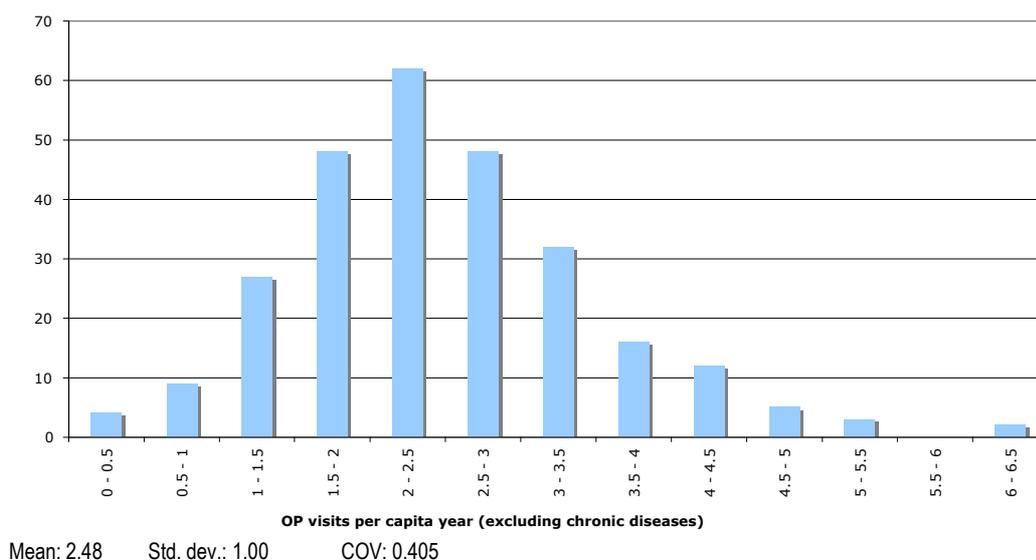
Chart 7.   SSO - frequency distribution of average adjusted relative DRG weights across medical providers, 2006

Table A.2. Average annual ARWs (IP) per capita across SSO providers, 2006

Mean: 0.046   Std. dev.: 0.0157   COV: 0.340
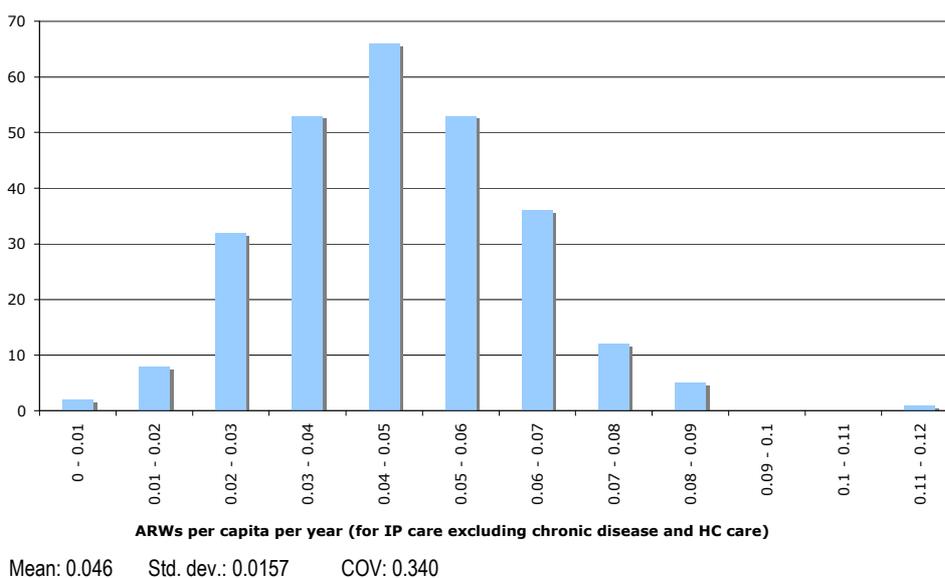
[24] Outpatient.

Table 3. SSO - capitation

Year			Capitation per capita [a]	Expenses per capita [b]		Multiple of capitation	
			Baht				
				Current [c]	Total	Current [c]	Total
1991	2534		700				
1992	2535		700				
1993	2536		700				
1994	2537		700	797	906	1.14	1.29
1995	2538		700	903	1111	1.29	1.59
1996	2539		800	1040	1178	1.30	1.47
1997	2540		800	1072	1194	1.34	1.49
1998	2541	*)	1,000 (< 50,000 registered)	1215	1381	1.22	1.38
		*)	900 (> 50,000 registered)				
1999	2542	*)	1,000 (< 50,000 registered)	1255	1445	1.25	1.44
		*)	900 (> 50,000 registered)				
2000	2543	*)	1,000 (< 50,000 registered)				
		*)	900 (> 50,000 registered)	1292	1480	1.25	
2000	2543	September	1,100				
2001	2544		1,100	1517	1815	1.38	
2002	2545		1,100	1512	1606	1.37	
2003	2546		1,100	1518	3202	1.38	
2004	2547		1,100	1600	1759	1.45	
2005	2548		1,250	1894	2232	1.51	
2006	2549		1,250	2030s	2390s	1.6s	1.9s
2007	2550	April	1,250	2040s	2400s	1.6s	
		May	1,284				
2008	2551	January	1,306				

*) 1,000 Baht are paid for the first 50,000 registered persons; 900 Baht for each additionally registered person.

[a] Excluding add-ons. [b] Expenses according to NHA per SSO member. [c] Excluding administration and investment. *S*: ILO estimates.

Source: SSO; IHPP; ILO calculations. *X*- rate (February 2008): 1 € = 47 Baht

Table 3 proves that over a period of 17 years the standard capitation per covered person increased by 87 per cent. Taking into account general price development, i.e. in real terms, it only increased by three per cent.

In comparison, current and total health expenses per capita increased by two and one-half times between 1994 and 2007, implying an increase of around 70 per cent in real terms. [25]

The widening gap between the standard capitation rate and expenses per SSO member is shown in the last two columns of Table 3. While the difference between them was only around 30 per cent in 1994/95, in 2007 total per capita expenses were approximately twice as high as the standard capitation rate. In effect, the widening gap shows that the SSO's general capitation policy was:

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[25] Deflated with the "headline consumer price index" as published by the Ministry of Commerce; 2008 based on own forecast.

(i) aiming to better address the SSO members' risk structure (through use of DRGs for high-cost cases),

(ii) reacting ad-hoc to provider (hospital) pressure, and

(iii) reflecting some degree of "fee-for-service-ization".

Meanwhile the mixture of payment mechanisms, as reflected in the SSO's capitation structure, has reached a certain degree of arbitrariness that often renders annual negotiations with the providers as to ad-hoc adjustments of the payment mechanisms inevitable. This process potentially adds more arbitrary elements to SSO's payment mechanism rather than reduces them. This policy was also not adequate to stop hospitals from de-registering with the SSO, a process that started in 2004/05 (Table 4). A detailed description of the 2008 status of provider payment mechanisms under the SSO is provided in Chapter 3.1.2 (SSO – current capitation estimation method).

Given this background, it is now time to reconsider the overall process of estimating the global capitation as well as the provider payment mechanism. As such considerations are also (to be) undertaken at the NHSO and, implicitly, the CSMBS (see below), close coordination should be sought from these two institutions in designing payment mechanism reform. It is important to note that expenses per member of the SSO and the UC capitation rate (including add-ons) are meanwhile at relatively equal levels.

Table 4.   SSO - current expenditure, covered persons and contracted hospitals

Year		Total	Current	Capitation	Covered persons ('000s)	Contracted hospitals
		Health expenses			Number	
		Million Baht				
1991	2534			945	2336	137
1992	2535			1786	2544	145
1993	2536			2130	2994	155
1994	2537	3286	2889	2550	3627	147
1995	2538	4418	3590	2792	3975	189
1996	2539	5343	4715	3643	4535	198
1997	2540	5655	5077	3803	4734	197
1998	2541	7951	6994	5659	5756	205
1999	2542	7394	6421	5074	5117	231
2000	2543	8367	7308	5808	5654	246
2001	2544	10752	8990	6518	5926	262
2002	2545	10684	10057	7316	6651	268
2003	2546	24858	11790	8541	7764	269
2004	2547	14253	12966	8967	8104	278
2005	2548	19123	16223	10708	8566	274
2006	2549	21800	18500	11969	9102	269
2007	2550	23000	19500	12200	9559	267
2008	2551					257

Source: SSO; IHPP; ILO. *X*- rate (February 2008): 1 € = 47 Baht.

Although the SSO expanded its health budget significantly over the years of its existence, it is obvious that the institution considers itself predominantly a "purchaser" of health services for the benefit of its members (as opposed to the NHSO, which, by its self-assessment - and reflected in its budgeting policies - is trying to "manage" health finance, i.e. execute health policies); therefore the SSO capitation adjustment uses more of an

"austerity" approach aiming to buy services for its members at the lowest price possible. Under these conditions, the main reasons for the rapid increase in the SSO's budget are the successful coverage expansion of the SSO, recurring provider complaints about underfunding, and respective adjustments in terms of "add-ons". As a consequence, these add-ons are not so much part of an explicit policy concept but rather the consequence of compromises in the annual bargaining process with hospitals. The fact that, for about the last five years, the SSO has been losing contracting hospitals raises questions with respect to the thoroughness of those negotiations. The fact that the government (Ministry of Labor) constantly pursues a "modern" policy of increased management turnover, which includes the SSO, might contribute to creating an atmosphere of "transitory responsibility" among top management levels, and very much contradicts the principles of stability, reliability and sustained professionalism required for successful long-term social and health policies.

Budgeting in the NHSO (UC)

The NHSO started its operations in 2001/2002 (fiscal year 2002) and it was therefore in a position to take advantage of the SSO experience. Nevertheless, the global capitation rate was set very low at the beginning, most probably (as in the case of SSO in 1991), too low. Officially, it was argued that providers' productivity reserves were (very) high, i.e. it was hoped that the additional utilization through (additional) NHSO members could be absorbed without overstretching provider capacities. It soon turned out, however, that the scheme was under-funded, and a "race" towards more acceptable capitation rate levels began (Table 5).

Table 5.   NHSO - UC budget estimates and government approved capitation rates

Activity/State of Approval	Unit	Period							
Calendar year		**2545 2002**	**2546 2003**	**2547 2004**	**2548 2005**	**2549 2006**	**2550 2007**	**2551 2008**	**2552 2009**
Budget estimate by NHSO (initial proposal at the beginning of calendar year for subsequent fiscal year)	Baht/year	1'202	1'414	1'447	1'717	1'842	2'089	2'140	2'312
Budget estimate approved by the Bureau of Budget (for preparation of Budget Act for subsequent fiscal year)		1'202	1'202	1'202	1'308	1'659	1'900	2'100	
Fiscal year		**2544/ 2545**	**2545/ 2546**	**2546/ 2547**	**2547/ 2548**	**2548/ 2549**	**2549/ 2550**	**2550/ 2551**	**2551/ 2552**
		2001/ 2002	**2002/ 2003**	**2003/ 2004**	**2004/ 2005**	**2005/ 2006**	**2006/ 2007**	**2007/ 2008**	**2007/ 2008**
Approved budget according to the Budget Act for fiscal year	Baht/year	1'202	1'202	1'202	1'308	1'308	1'659	2'100	
Additional budget granted by the Government during fiscal year				106	88	351	241		
Final approved expenditure of the UC scheme in fiscal year		1'202	1'202	1'308	1'396	1'659	1'900	2'100	

Source: NHSO. *X*- rate (February 2008): 1 € = 47 Baht.

An overview of the development of the overall spending of NHSO is provided in Table 6.

Table 6.   NHSO - UC expenditure

Item	2002	2003	2004	2005	2006	2007	2008
				Million Baht			
Salaries	23'796	25'553	27'640	26'693	27'594	24'003	25'385
Medical services	27'612	30'538	33'573	40'790	51'632	63'509	72'216
AIDS					2796	3856	4382
Administration	1'597	1'600	869	407	369	533	451
Total	**53'005**	**57'691**	**62'082**	**67'889**	**82'392**	**91'899**	**102'436**
Capitation				**Baht**			
Expenditure per member	1'204	1'204	1'309	1'396	1'659	1'900	2'100
Total expenditure				**%**			
In % of GDP	1.0	1.0	1.0	1.0	1.1	1.1	1.1
In % of general Government Current Revenue	5.8	5.3	5.1	4.8	5.3	5.7	6.0

Source: NHSO; ILO; 2008: partially preliminary estimates; methodological differences with Table 1.
X- rate (February 2008): 1 € = 47 Baht.

It is expected that in 2009 the UC capitation rate will reach a level in the order of around 2500 Baht. This implies that in nominal terms the amount reached after 6 years will have about doubled. Taking into account general price development,[26] i.e. calculated in real terms, it will have increased by about two thirds of its initial level. Meanwhile, there seems to be consensus achieved between the central government (BoB) and the NHSO administration that the level of global capitation reached broadly covers providers' nominal costs (at present infrastructure) *and* reflects actual health resource needs of UC members.

As the UC expenditure elasticity with respect to nominal GDP is above 1, the share of gross generated income (GDP) re-distributed through UC has been increasing. As a share of general government revenue, UC first declined slightly but has been recovering since 2005. A slightly increasing trend approaching and exceeding 6 per cent of total government revenue can be considered acceptable.

Equally important as the above macro-observations is the fact that the NHSO administration succeeded in bargaining with the government (BoB) to obtain a substantial reduction in the share of provider salaries to be covered by the capitation rate. While this share was around 45 per cent of capitation in the years 2002 to 2004, it has declined to just above 25 per cent in 2007/2008, which is significant strategic progress in favor of UC members' health needs.

The allocation (provider payment) mechanism of the UC scheme differs in various respects from that of the SSO. The main difference, however, is that since its implementation, the NHSO, in cooperation with its contracting public and private hospitals, has been using relative DRG-weights for allocating the global in-patients budget to the providers. Although the NHSO's relationship with providers is not completely free from conflict,[27] as

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[26] Deflated with "headline consumer price index" as published by the Ministry of Commerce; 2008 and 2009 based on own forecasts. It should be recalled that the CPI is used here only for indicative reasons; the more adequate index for price measurement in the health sector would be a health-PPI, which only exists in rudimentary format (at MoC).

[27] See SSO conflicts with (some) hospitals, as described above.

some of the NHSO-contracting hospitals have (still) been running deficits (2007), there is increasing consensus that the NHSO's provider payment mechanism is relatively reliable, rational and acceptable to all stakeholders. The NHSO is in the process of trying to overcome the remaining payment inconsistencies with the help of proposals made in this report aiming at an improved allocation formula that takes into account both the government's general health policy orientation and the providers' immediate financial interests.

Budgeting in the CSMBS

CSMBS provider payments are based on fee-for-service. Until recently, the volume of expenses was not considered critical by the government, however over the last two years annual growth rates were over 25 per cent, triggering growing concern at government level (Table 7). While in-patient expenses seem to be relatively under control (with the exception of 2006), out-patients outlays have been soaring since 1999 - as of 1999 out-patient spending increased every year significantly faster than in-patient spending. Most obviously there was a "behavioral change" after the financial crisis of 1997, due to changes in legislation affecting providers' focus on CSMBS-covered out-patients. [28]

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[28] In aiming to single out the CSMBS cost drivers, Monnaporn Benjaporn investigates in some detail (1) age structure of beneficiaries, (2) illness severity and/or complexity of medical services, (3) cost categories of CSMBS health care expenditure (in different hospital groups), and (4) adjustments of administrative processes. She found that nearly 50 per cent of all CSMBS *in-patients* were older than 60 years and that the number of patients in this group increased over time. While the average length of stay decreased from 10.05 days in 2003 to 6.54 days in 2007, the relative DRG weight (RW) increased. When examining cost groups of in-patient expenditures in 2004-2006, medicines were the most expensive category. At the same time, the cost of medicine shared the highest proportion of admission expenditure. Other high share costs were room and board cost, operation and delivery cost, and nursing services cost. The highest increase in costs for *in-patients* is observed for medical devices and artificial organs and other high growth costs i.e. medical equipment usage cost, nursing services cost, physical therapies cost, laboratory investigation and pathology cost, and blood transfusion services and blood components cost. With respect to the cost growth in spending on *out-patient* care, Benjaporn suspects that the introduction of the electronic payment system (direct settling of bills between providers and CSMBS) had a significant impact (moral hazard of both providers and patients). For further information see: Monnaporn Benjaporn: The possible cost drivers of the expenses under the Civil Servant Medical Benefit Scheme in Thailand. SPF Master Thesis, Maastricht Graduate School of Governance, Maastricht University. Maastricht, October 2008.

Table 7. CSMBS - expenditure and central government budget

Year		Budget Total	without CSMBS	CSMBS Total	OP	IP	Total	OP	IP	Total	OP	IP	Budget Total	excl. CSMBS
		Million Baht					Share in Budget (%)			Growth (%)				
1989	2532			3,521	1,485	2,036								
1990	2533			4,316	1,729	2,587				22.6	16.4	27.1		
1991	2534			5,127	2,022	3,106				18.8	16.9	20.1		
1992	2535			5,964	2,337	3,627				16.3	15.6	16.8		
1993	2536	560,000	552,093	7,907	2,766	5,140	1.4	0.5	0.9	32.6	18.4	41.7		
1994	2537	625,000	615,046	9,954	3,374	6,580	1.6	0.5	1.1	25.9	22.0	28.0	11.6	
1995	2538	715,000	703,844	11,156	3,972	7,184	1.6	0.6	1.0	12.1	17.7	9.2	14.4	14.4
1996	2539	843,200	829,613	13,587	4,826	8,761	1.6	0.6	1.0	21.8	21.5	21.9	17.9	17.9
1997	2540	984,000	968,498	15,502	5,625	9,877	1.6	0.6	1.0	14.1	16.6	12.7	16.7	16.7
1998	2541	923,000	906,560	16,440	5,866	10,574	1.8	0.6	1.1	6.0	4.3	7.1	-6.2	-6.4
1999	2542	825,000	809,747	15,253	6,206	9,048	1.8	0.8	1.1	-7.2		-14.4	-10.6	
2000	2543	860,000	842,942	17,058	7,007	10,050	2.0	0.8	1.2	11.8		11.1	4.2	4.1
2001	2544	910,000	890,819	19,181	8,123	11,058	2.1	0.9	1.2	12.4	15.9	10.0	5.8	5.7
2002	2545	1,023,000	1,002,524	20,476	9,509	10,967	2.0	0.9	1.1	6.8	17.1	-0.8	12.4	12.5
2003	2546	999,900	977,214	22,686	11,350	11,335	2.3	1.1	1.1	10.8	19.4	3.4	-2.3	-2.5
2004	2547	1,163,500	1,137,457	26,043	13,905	12,138	2.2	1.2	1.0	14.8	22.5	7.1	16.4	16.4
2005	2548	1,250,000	1,220,620	29,380	16,943	12,437	2.4	1.4	1.0	12.8	21.8	2.5	7.4	7.3
2006	2549	1,360,000	1,322,996	37,004	21,896	15,109	2.7	1.6	1.1	26.0	29.2	21.5	8.8	
2007	2550	1,566,200	1,519,719	46,481	30,833	15,649	3.0	2.0	1.0	25.6	40.8	3.6	15.2	
2008	2551	1,660,000	1,604,759	55,241	39,593	15,649	3.3	2.4	0.9	18.8	28.4	0.0	6.0	

Source: Comptroller General; 2008: author's own calculations.

X- rate (February 2008): 1 € = 47 Baht.

While the share of the government budget of the CSMBS is still low at 3 to 3.5 per cent, its growth dynamics are worrying and call for cost-control measures. This concern needs to be seen against the background that the CSMBS currently spends resources equal to around two thirds of the total volume of the UC, while the number of members in the CSMBS is only around ten percent of that of the UC. At present spending dynamics, it would only take another four to five years for the CSMBS to be spending more than the UC.

It must be acknowledged, however, that providers seem to be increasingly "milking" the CSMBS because of the austerity policies of the other two public schemes, the SSO and the UC (government), towards their contracting providers. In other words, the CSMBS might have been used by the providers in order to cross-subsidize the patients covered by the other two schemes (see below).

3.1. Present formal procedures

In the past, the procedures used to estimate the global budgets of the NHSO and the SSO can be summarized as follows: [29]

The NHSO's overall capitation process was driven by an attempt to obtain an increased level of funding for the UC scheme, which had been fixed far too low at the outset of the UC budgeting process in 2001 (fiscal year 2002). The NHSO administration had tried to convince the BoB to allocate higher resources per member backed by of evidence-based procedures (as required by the BoB). The available statistical information, however, was often either truncated, had relatively high sampling errors, or was of an ad-hoc nature, which introduced a degree of arbitrariness to the annual budgeting proposal made by NHSO. This, in turn, contributed to the BoB's reluctance to accept NHSO's reasoning behind its budget proposal, prompting BoB to make ad-hoc adjustments to NHSO's proposals – adjustments which were more often driven by concrete problems of BoB's overall budget compilation than by the needs of the UC scheme and its members.

In the meantime, however, even with improved statistical information, there now seems to be geneeral agreement between the NHSO and BoB that the general level of spending per member of the UC is acceptable and this is no longer a subject of dispute between the two institutions. Future negotiations can thus concentrate on the correct adjustment mechanism for the global capitation fee. In the next section of this report is a concrete proposal as to how to proceed in future with respect to capitation adjustment which should be acceptable to both the BoB and the NHSO.

The SSO's approach to budgeting for its health expenses has been to minimize purchaser spending (costs). As far as can be concluded from analyzing the evolvement of past expenditure levels and structures, expenses were not predominantly seen as instruments that could be used pro-actively for influencing (managing) health service provisions (quantity and quality) but rather re-actively, as resources to cover the unavoidable costs of providers. Cost-containment was the guiding principle of adjusting (or rather not adjusting) the global capitation fee. When global capitation adjustments were not considered acceptable, "add-ons" were introduced in order to respond to the specific needs of members and/or complaints of providers (hospitals). As a consequence, a shift from a pure capitation-based provider payment model towards a hybrid model, using capitation and fee-for-service payments, has emerged over time.

For many years, the budget of CSMBS has been considered by BoB budget planners a *quantité négligeable*. Due to the unacceptably high growth dynamics of the expenses of the CSMBS in recent years, budget planners have started focusing on measures to keep the expenses of CSMBS under control. In 2007, the use of DRGs was introduced in CSMBS financial relations with providers. For the past couple of years, DRG 'creeping' has been observed and had been accepted, according to one official version, because hospitals were on a "learning curve" with respect to understanding a correct coding of the DRGs. One of the measures envisaged to keep the expenses of CSMBS under control is, as of 2008, to cap DRG creeping at five per cent per year.

The main cost problem of CSMBS is, however, not related to in-patients but to out-patients. ***This report will therefore outline proposals for reform of the CSMBS as forwarded by the comptroller general. Whether CSMBS can, in the long run, maintain***

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[29] ILO/Thailand Report 2: *The calculation of capitation fees and the estimation of provider payments. Initial review,* under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC).

its fee-for-service provider payment mechanism is an open question. There are other options to control expenditure dynamics under fee-for-service systems (other than switching to capitation), but they seem to require more complex administrative, legal and statistical reporting systems than are available to the CSMBS at present and in the foreseeable future.

3.1.1. NHSO – current capitation projection and estimation method[30]

Projection procedures

After some experimentation with projection procedures since the implementation of the UC scheme in 2002, since 2007 the global capitation projection method has gained clarity and stability. Basically, the method of determining C_{t+1}, i.e. the capitation in t+1, can be described as follows:

$$C_{t+1} = C^{OP} + C^{IP}$$

$$C^{OP}_{t+1} = ur^{OP}_{t+1} * uc^{OP}_{t+1}$$

$$C^{IP}_{t+1} = ar^{IP}_{t+1} * CMI_{t+1} * b^{DRG}_{t+1}$$

$$ur^{OP}_{t+1} = ur^{OP}_{t} * (1+w\text{UR})$$

$$uc^{OP}_{t+1} = uc^{OP}_{t} * (1+w\text{UC})$$

$$ar^{IP}_{t+1} = ar^{IP}_{t} * (1+w\text{AR})$$

$$CMI_{t+1} = CMI_{t} * (1+w\text{CMI})$$

$$b^{DRG}_{t+1} = b^{DRG}_{t} * (1+w\text{DRG})$$

Where:

C	:=	Total capitation per UC member per year
C^{OP}	:=	capitation for out-patients per year
C^{IP}	:=	capitation for in-patients per year
ur^{OP}	:=	number of out-patient contacts per member per year
uc^{OP}	:=	costs per out-patient contact (Baht per contact)
ar^{IP}	:=	number of in-patient admissions per member per year
CMI	:=	Average DRG-weight per year, with
		CMI = sum(DRG-weights p.a.) / sum(Admissions p.a.)
b^{DRG}	:=	DRG-base rate, with
		b^{DRG} = sum(IP-costs p.a.) / sum(DRG-weights p.a.)
$w\text{UR}$	:=	growth rate of OP contacts per member
$w\text{UC}$	:=	growth rate of cost per OP contact

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[30] For earlier years, see ILO/Thailand Report 2: *The calculation of capitation fees and the estimation of provider payments. Initial review,* under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC).

wAR := growth rate of IP admissions per member

wCMI := growth rate of CMI

wDRG := growth rate of b^{DRG}

Once the data for t are fixed, the budgeting process consists basically of setting the growth rates wUR, wUC, wAR, wCMI and wDRG with the agreement of the administration of the NHSO and the BoB. [31]

The values for wUR, wAR and wCMI (i.e. "quantities") are basically found by time-series analysis (trend regression). In the meantime, an increasing number of observed values is available. Up to now the growth rate wCMI has deliberately been set to *zero* as only a short time series of four sets of annual DRG sums is as yet available, of which two are statistically flawed. Once a statistically stable time-series is available, explicit projections of DRG change (wCMI) will be made.

The values for wUC and wDRG are set by constructing a "composite cost index", which, for the time being, consists of the following labor and non-labor cost components (reflecting the overall provider cost structure) (see Table 8):

Table 8. **Provider cost structure**

Providers	Code	FY2007	FY2008	FY2009
Cost components		Weight (%)		
Salaries	L11	30	30	30
Temporary wages	L12	5	5	5
Incentives & compensations	L2	16	16	16
Medicine	MC1	29	29	29
Utilities	MC2	3	3	3
Other medical costs	MC3	<u>16</u>	<u>16</u>	<u>16</u>
TOTAL		100	100	100

FY = Fiscal year; sum-difference with 100 due to rounding of original values.

The cost structure is based on information derived from 'Report #5'. [32]

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[31] In the context of the project, a model has been developed which, more precisely, calculates C_{t+1} on the basis of a demographic modelling approach, i.e. by single ages (0, 1, 2, ..., 1000) and sex, including other variables. A shortcut version of the approach is described here. For a more detailed explanation, see ILO/Thailand Report 7: *Development of a Common Health Care Financing Model Documentation of work and progress*; under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC).

[32] 'Report #5' is a standardized monthly financial report of around 800 hospitals sent to the MoPH.

Table 9.   Provider cost development

Providers	Code	FY2007	FY2008	FY2009
Cost inflation indicators		Growth rates (%)		
Government salaries	L11	6.0	11.0	6.0
Temporary wages	L12	6.0	11.0	6.0
Incentives & compensations	L2	0.0	0.0	0.0
Medical CPI (sub-component CPI)	MC1	0.5	0.5	0.5
Electricity CPI (sub-component CPI)	MC2	1.5	1.5	1.5
CPI	MC3	2.3	3.4	2.5
FY = Fiscal year.				

The growth rates of the cost drivers have to be projected, of course.

The growth rate for *salaries* (code L11, Table 9) is set exogenously equal to the expected growth rate of salaries paid to government officials, as most doctors and many nurses have the status of government officials. This estimate is biased to the extent that it does not take into account salary developments in private hospitals, which might differ. The bias is, however, considered small. The following points should also be noted. There is no distinction made between nominal and effective wage developments nor between accrued and actually paid wages; the concepts of wage drift, although potentially important, are not applied and no differentiation is made with respect to wage developments of professional groups (doctors, nurses, technical staff, support staff, etc).

The growth rate for *temporary wages* (code L12, Table 9) is usually assumed to be equal to that of salaries, as persons with temporary contracts have a different status to that of government officials but are generally being treated the same with respect to salary development. Again, no use is made of differentiated wage concepts.

Incentives and compensations (code L2, Table 9) are multi-purpose and partially performance-based payments to provider staff. Payment is basically at the discretion of the government (MoPH). The growth rate has been set equal to zero for the years 2007 to 2009.

The *medical CPI* (code MC1, Table 9) is a sub-index of the general CPI and is used for indexing providers' costs of medicine. In the past, the medical CPI has developed very moderately, well below the general CPI. By its nature, the medical CPI *is the wrong index* for measuring providers' medicine costs (medicine being used for providers' (hospitals') production of health services) as it measures the price development of a consumer market, not the costs of producers (which would require a PPI[33] variant). The index is not only wrong by its construction, but also by its dynamics. It can be assumed that actual medical cost development within the production function of hospitals in Thailand (as elsewhere) is much higher than measured by the medical CPI.[34] It can be concluded, therefore, that provider cost development is underestimated with respect to this cost component (code MC1), however, the method can be tolerated as long as no better evidence-based information on providers' actual medical cost development exists. The actual growth rates of the CPI set for 2008 and 2009 seem to be very conservative as they seem to ignore the impact of the world-wide increase in energy prices. Given Thailand's high oil-import

[33] Producer Price Index.

[34] The high cost dynamics under outpatient expenditure of the CSMBS points in that direction.

dependency, this will certainly impact on domestic energy prices, despite the appreciation of the Baht versus the USD. Increases in energy prices will inevitably also affect other CPI sub-indexes, and thus, the overall CPI.[35]

The *electricity CPI* (code MC2, Table 9) has been recently introduced in order to take into account a cost component that might gain importance in future. For the time being, it serves as a dummy for all utilities. It is expected that, after improvements in hospital accounting, providers' cost structures can be further broken down so that the costs of water and possibly other utilities are accessible to explicit modelling and assumption setting. The actual growth rates of the *electricity CPI* assumed for 2008 and 2009 seem to be too low; the remarks made with respect to CPI (see above) apply *mutatis mutandis*.

The development of other medical costs is represented by CPI development (code MC3, Table 9). The same remarks apply to this growth index as those made under MC1 and MC2.

The sum-products of the respective annual columns of Tables 8 and 9 calculate average annual growth rates; the results are 2.70 per cent for FY 2007, 4.65 per cent for FY 2008 and 2.72 per cent for FY 2009.

Table 10 provides a summary of the NHSO's projection procedures for the years 2007 to 2009, including a medium-term extrapolation until 2012 (government medium term fiscal planning horizon).

Table 10.   UC capitation estimation

Year	Endog. ur^{OP}	Exog. w^{UR}	Endog. uc^{OP}	Exog. wUC	Endog. Annual cost OP		Endog. ar^{IP}	Exog. wAR	Endog. CMI	Exog. wCMI	Endog. b^{DRG}	Exog. wDRG	Endog. Annual cost IP		Endog. Annual cost OP & IP	
	Number of contacts p.a.	%	Baht per contact	%	Baht	%	Number of admissions p.a.	%	Index	%	Baht	%	Baht per member	%	Baht per member	%
Column	1	2	3	4	5 = col1*col3		6	7	10	11	8	9	12 = col5*col8*col10		13 = col5+col12	
2007	2.555		271		692		0.103		0.92		9567		911		1603	
2008	2.643	3.45	284	4.65	750	8.26	0.110	6.93	0.92	0.00	10012	4.65	1019	11.90	1769	10.33
2009	2.746	3.87	291	2.72	800	6.70	0.117	6.27	0.92	0.00	10285	2.72	1112	9.16	1912	8.12
2010	2.842	3.50	300	3.00	853	6.60	0.124	6.00	0.92	0.00	10593	3.00	1215	9.18	2067	8.10
2011	2.941	3.50	309	3.00	909	6.60	0.132	6.00	0.92	0.00	10911	3.00	1326	9.18	2235	8.12
2012	3.044	3.50	318	3.00	969	6.60	0.139	6.00	0.92	0.00	11238	3.00	1448	9.18	2417	8.13

Endog.: endogenous = result of calculations; Exog.: exogenous = assumption (input to calculations). % = growth rate. For further annotations: see text.
Source: ILO calculations (as of early 2008) on the basis of government assumptions. Results are of an illustrative nature only.

Estimation of data base (base year of projection)

While the procedures appear to be straightforward and clear, once assumptions have been fixed, the projected results depend on the start values, i.e., for example, the values documented in Table 10 for the year 2007.

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[35] This report was completed before any deflationary impact of the financial crisis (2009) took effect.

In situations (i.e. countries or systems) with well developed statistical infrastructure, it can usually be expected that reliable statistical information is made available on a periodical routine basis for use as a basis for budget projections. This is not the case in the annual budgeting process of the UC (NHSO). Instead, the NHSO has to produce its own estimations of data on which to base its budget projections on an annual basis. These *estimations of the data base* must not be confused with the projection method (described above).

To the extent that the necessary estimations of the data base allow for judgment, albeit professional, the fact that those estimations are being carried out by the NHSO itself indicates that some estimation bias, favoring the budget needs of NHSO, is most likely unavoidable. In this respect, the estimation of the data of the projection base year must be considered part of the projection procedure.

Several "judged" professional estimations have to be undertaken annually. The following is a list of the estimations, including the assumptions used, that were undertaken in the budgeting process for the fiscal year FY2009. The base year was 2007:

1. Break-up of total provider expenditure into prevention and promotion (PP), out-patient expenses (OP), and in-patient expenses (IP), by hospital type, according to the following key (based on report #5, excluding 'bad debt', 'doubtful accounts', and 'depreciation'):

    •   For Primary Care Units (PCUs):   PP: 79% and OP: 21%
                                           (No IP is provided at PCUs)

    •   For Community (district) hospitals: PP: 10% and OP&IP: 90%

2. Community (district) hospitals do not report OP and IP expenditure separately; thus OP and IP expenditure was estimated on the basis of:

    reported utilization rates (i.e. routine result of NHSO operations), and

    assumed costs per 1 IP admission = 16.03 * costs per 1 OP contact,
    resulting in an allocation of just above 5 per cent on OP and below 85 per cent on IP; the 1 : 16.03-cost-relation dates back to the findings of a small (double-digit) hospital-sample taken prior to 2005;

    •   For General hospitals: PP: 2% and OP&IP: 98%

3. Again, hospitals do not report OP and IP expenditure separately; thus OP and IP expenditure was estimated on the basis of

    reported utilization rates (= routine result of NHSO operations), and

    assumed costs per 1 IP admission = 19.01 * costs per 1 OP contact,
    resulting in an allocation of just under 5 per cent on OP and 93 per cent on IP; the 1 : 19.01-cost-relation dates back to findings of a small (double-digit) hospital-sample taken prior to 2005;

4. Calculation of the *average DRG base rate* by dividing total estimated IP expenditure (step 2, see above) by the total number of reported (Adjusted) Relative Weights (ARWs) (i.e. routine result of NHSO operations).

5. Calculation of the *average case-mix index* (CMI) by dividing the total number of reported ARWs by the total number of reported IP admissions (i.e. routine result of NHSO operations).

6. Calculation of average quarterly utilization rates for OP and IP (i.e. routine result of NHSO operations).

In the above list the allocations of hospital expenditure on PP, OP and IP, as well as the cost relations used (1 : 16.03; 1 : 19.01) are less reliable elements as they are not based on sufficient, and up-to-date, statistical information.

The other weak statistical element already commented on above is the provider cost structure (Table 8).

As yet, no routine has been established that would allow for corrections of the periodical estimation process on the basis of variance analysis, i.e. the differences between results or estimates of the statistical basis (wages, prices (see Table 8: Provider cost structure and Table 9: Provider cost development); and allocation on PP, OP and IP) and actual statistical results. [36]

Although the statistical situation must be considered sub-optimal, there are good reasons for those estimates/statistics being provided by the NHSO. One reason is that NHSO is itself producing (collecting) some of the required statistics as a result of its administrative routine and no other institution has these data; any statistical flaws therefore are open to improvements at NHSO level. Another good reason is the fact that there is no other institution that would assume the role of an "independent statistics producer/parameter estimator" in lieu of the NHSO. This latter reason has to be seen in the context of the much wider and deeper-rooted problems of Thailand's statistical system in general, one of which is the sub-optimal allocation of responsibilities between the NESDB and the NSO as well as the generally underdeveloped statistical infrastructure.

Conclusions

The above procedures incorporate demand- as well as supply-driven factors of Thailand's health system. Demand factors are being represented by the number of members of the UC scheme, the frequency by which they use the system (utilization) and the DRGs (CMI) representing the severity of IP cases. Supply factors are being represented by the composite inflation rate.

It is obvious however that utilization rates as well as DRGs (CMI) can be influenced by the supply side of the health system. As utilization rates are very low in international comparison for the time being, some supply-side geared increases in utilization rates might be tolerated or even welcomed from a health policy point of view in order to improve the health status of Thailand's population, which might be dependent on increased use of the system. With medical progress, some tendency towards increasing average DRG weights (CMI) must be accepted; however, it is obvious that policies explicitly fostering such movements through a "light-handed" budgeting process cannot be sustained in the long run. Not only would this be contradictory to the generic idea of "capitation" (see introduction), but it would also offer the providers a "creeping element" of auto-generation of income which is inherent in fee-for service-systems but, at least by concept, alien to capitation systems.

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[36] The reason for this is the inadequacy of Thailand's overall statistical data reporting and compilation system. See ILO/Thailand Report 9: *A Data Reporting Framework,* under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC). Part of the inadequacy is that the NHSO estimates its overall budget by certain budget lines (and allocates the total budget to hospitals according to certain indicators) but does not receive information from providers (hospitals) as to how they actually spend the monies received.

While those conceptual flaws have obviously been accepted by all parties involved in the budgeting process, counterbalancing measures were implemented in the projections of the above-mentioned composite inflation factor, which consists of a weighted forecast of per capita salaries in the medical sector (provided by the MoF/MoPH) and the medical CPI. The CPI, by construction, has traditionally been measuring only very low cost increases of medical goods and services that are freely available to private households in pharmacies and other points of market-delivery. In other words, the UC capitation projection process has thus far more or less ignored these factors driving health care costs, which are internationally (and nationally) stipulated as "technical progress". Without a doubt, this budgeting practice has contributed to Thailand's general fiscal stability; however, at the same time, it might have partially contributed to some deterioration of services provided by public hospitals to the extent that they have been forced to operate under tight resource constraints.

3.1.2. SSO – current capitation projection and estimation method [37]

In projecting the SSO's global budget, distinction has to be made between the part that is being determined by standard capitation, and those parts that have been called "add-ons", i.e. budget resources made available for expenditure beyond "normal treatment" (Table 4 above).

The standard capitation-related part is determined by multiplying the annual global capitation by the number of health-covered SSO members. The number of members is determined by the development of the labour markets and, in this respect, not under the control of the SSO. Further, the number of members is determined by the "coverage extension" policies of the SSO, which depend on legislation and law enforcement.

The only variable that can be influenced by the SSO itself is the capitation rate, including rates of any "add-ons" or other payments outside the general capitation system.

In the past, the global capitation was set ad-hoc. For the time being, no procedure exists that would allow for describing the formalities of the calculation of the global capitation. Most recent adjustments, if any, were made on the basis of the medical CPI, i.e. the sub-index of the CPI as calculated on a monthly basis by the MoC (Chapter 2).

It has been explained elsewhere [38] that the medical CPI is systematically not the correct indicator for measuring cost developments on the provider side, as the medical CPI measures final demand price developments on markets to which private households have direct access as consumers, i.e. for example in pharmacies and similar institutions selling "harmless" medical products. In order to accurately measure provider costs, their measurement must take place where the costs to the providers materialize, i.e. on the providers' input-side (where providers buy their labour and non-labour inputs for their health production). For this purpose, an index measuring *costs of provider input* to health production is considered adequate. Such an index does not yet exist in Thailand, but the medical CPI is clearly no adequate substitute.

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[37] For earlier years, see ILO/Thailand Report 2: *The calculation of capitation fees and the estimation of provider payments. Initial review,* under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC).

[38] See ILO/Thailand Report 2: *The calculation of capitation fees and the estimation of provider payments. Initial review,* under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC). In this paper, the use of the medical CPI is being recognized without further comments; it has, however, meanwhile been established that using the medical CPI (sub-index of the CPI) for the intended purpose of measuring provider costs is systemically wrong.

The other sub-items of the SSO budget are being estimated as "add-ons", based on ad-hoc considerations, information and considerations at hand. The estimations are made with the understanding that services should be purchased at minimal costs, which is a well-justified goal but omits the possibility of using the budget for actively co-shaping Thailand's health provision system, in coordination with the other purchasers (Table 11 below).

Table 11.   **SSO medical expenditure, breakdown of current accounts**

Health care expenditure	2002	2003	2004	2005	2006	2007
	Million Baht					
Total Expenditure	9278	10882	11604	14295	15782	*16000*
1. Basic capitation	7316	8541	8967	10708	11378	
2. Incentive utilization	373	432	437	488	500	
3. High cost special services	118	152	184	233	271	
4. Risk adjusted (capitation)	998	1165	1223	1756	1866	
5. HIV/AIDS	0.0	0.0	114	284	450	
6. Bone marrow transplantation	16	4	10	8	10	
7. Hemodialysis (visits)	136	178	225	285	353	
8. Emergency & Accident	146	200	213	283	345	
9. Dental care	176	210	231	246	592	
10. Kidney transplant				4	19	
11. Cornea transplant						
Registered persons (year-average in thsd.)	6651	7764	8104	8566	9102	9559
Expenditure per capita	1395	1402	1432	1669	1734	
Increase (%)	*0.16*	*0.47*	*2.17*	*16.53*	*3.91*	

Source: SSO; structure and contents not fully compatible with data provided in table 4.
X- rate (February 2008): 1 € = 47 Baht.

The consultation and negotiation process applied by the SSO administrative bodies and committees in order to prospectively fix the global resource *allocation* play a dominant role in estimating the overall budget. Details about the respective considerations currently made can be found in Chapter 4.1.2.

3.1.3. CSMBS

The budget of the CSMBS has widely been perceived by the various government fiscal steering committees, and by the BoB, as a *quantité négligeable*. There is therefore no explicit and formal procedure established as yet in order to project the budget of the CSMBS. As with the SSO, the main role of the CSMBS has been considered to be the purchase of health services; however unlike the SSO, the CSMBS would make purchases at whatever costs would be charged by providers (according to listed schedules etc.).

For these reasons, an explicit budget estimation process is only slowly evolving. It is hoped that the CSMBS will establish such procedure as a result of this project.

3.2.   Proposal for revised procedures

In this chapter proposals will be outlined as to how to improve the overall budgeting process of the UC (NHSO) and the SSO. The main focus will be on the NHSO.

In this project there is no such proposal made for the CSMBS because there are currently only limited measures in place to effectively manage health costs of CSMBS-covered persons. For example, the comptroller general accepts DRG-creeping only up to 5 per cent per annum and any further payments will be stopped. At present, however, in-patient costs do not seem to be CSMBS' main concern. As shown above, it is actually the out-patient related costs that have recently started exploding, which seem to be related to so-called *non-essential drugs* on which providers, when selling them to their CSMBS-patients, make a profit in the order of 30 per cent.

The department of the comptroller general is aware of the situation and has therefore proposed some reform options, which can briefly be summarized as follows:

1. Implementation of co-payment for CSMBS out-patients:

    a. Individually, beneficiaries would have to pay 20 per cent of the total expenditure on non-essential drugs.

    b. Individually, beneficiaries would have to pay 25 per cent of total out-patient expenditure.

2. Implementation of a capitation payment system for out-patients, using actual expenditure of 2007 as the base year.

3. Establish a health insurance system for members of the CSMBS.

It was agreed with the ILO that the calculations for each scenario should be undertaken by CSMBS staff after completion of training at the Graduate School of Governance, Maastricht, and once the health financing model (CSMBS module) is readily available. The calculations are not of a complicated nature; however it is crucial that as a prerequisite information on CSMBS members' salaries and pensions should be available in order to provide meaningful scenarios and estimations. [39]

3.2.1. NHSO – proposals for improvement of capitation projection (budgeting) process

In principle, there is no need to change the budgeting process in the NHSO. As is shown above, the approach taken is straightforward, logical and simple. It fulfills the transparency criteria required for budgeting procedures in general. Further methodological backup of the process will be provided through the health financing model as developed under the project. [40]

There is, however, one essential aspect that needs attention. If it is not taken care of over the medium-and long term, the logical budgeting process could result in economically and financially flawed results.

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[39] See ILO/Thailand Report 7: *A Common Health Care Financing Model for the main health purchasing agencies: Universal Coverage Scheme, Social Security Scheme, and the Civil Servants' Medical Benefits Scheme; User Manual.* Prepared in the context of ILO/EU project: Financial Management of the Thai Health Care System (THA/05/01/EEC).

[40] idem: ILO/Thailand Report 7: *A Common Health Care Financing Model for the main health purchasing agencies: Universal Coverage Scheme, Social Security Scheme, and the Civil Servants' Medical Benefits Scheme; User Manual.* Prepared in the context of ILO/EU project: Financial Management of the Thai Health Care System (THA/05/01/EEC).

The problem basically consists of the fact that no ex-post correction mechanism yet exists in the capitation calculation process that would take account of:

(1) estimation errors in the data base (i.e. data of the revolving base year of projections), and

(2) deviations of projected values from their actual outcome ex-post.

For example, in Tables 12 and 13 below, it is unclear which figures for FY2007 are statistical results and which are still estimates/projections.[41] While routine statistical procedures exist at MoC with respect to the CPI (and its sub-indexes), no (generally accepted) equivalent exists for the provider cost structure and for the other cost drivers (Table 13), i.e. for government salaries, temporary wages and incentives and compensations in the hospitals contracting with the HNSO.

Table 12.   Provider cost structure

Providers Cost components	Code	FY2007 (%)
Salaries	L11	30
Temporary wages	L12	5
Incentives & compensations	L2	16
Medicine	MC1	29
Utilities	MC2	3
Other medical costs	MC3	<u>16</u>
TOTAL		100

FY := Fiscal year; sum-difference with 100 due to rounding of original values.
Source: Excerpt from Table 8.

Table 13.   Provider cost development

Providers Cost inflation indicators	Code	FY2007 (%)
Government salaries	L11	6.0
Temporary wages	L12	6.0
Incentives & compensations	L2	0.0
Medical CPI (sub-component CPI)	MC1	0.5
Electricity CPI (sub-component CPI)	MC2	1.5
CPI	MC3	2.3

FY: = Fiscal year. % = growth rate.
Source: Excerpt from Table 9.

Unless these deficiencies are addressed in the near future, projection problems will occur.

The reason that these problems will occur is that the capitation projection process as described and fully endorsed in Chapter 3.1.1 describes cost development correctly in

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[41] Actually, in NHSO budgeting practice, all of these variables remain permanently virtual as no adequate statistical reporting system exists.

theoretical terms. It also basically states (correctly) that costs can be described by multiplying numbers of occurrences (cases or contacts) with the costs of those occurrences. Budgeting (projecting), then, means to set assumptions that allow for the moving of the variables, reflecting those occurrences and their costs, from t (base year) to t+1 (projection year). In setting the assumptions, the aim is to match (unknown) future developments of reality (as measured by statistics) as closely as possible.

With respect to the present situation, referring back to Table 10, the calculation of the capitation for 2009 is based on assumed growth rates for 2008 and 2009, while basing these growth rates (partially) on estimations for the base year 2007. The result is repeated in Table 14 below.

Table 14.   UC capitation estimation

Year	Endog. ur^{OP} Number of contacts p.a.	Exog. w^{UR} %	Endog. uc^{OP} Baht per contact	Exog. wUC %	Endog. Annual cost OP Baht	%	Endog. ar^{IP} Number o admissions p.a	Exog. wAR %	Endog. CMI Index	Exog. wCMI %	Endog. b^{DRG} Baht	Exog. wDRG %	Endog. Annual cost IP Baht per member	%	Endog. Annual cost OP & IP Baht per member	%
Column	1	2	3	4	5=col1*col3		6	7	10	11	8	9	12= col5*col8*col10		13= col5+col12	
2007	2.555		271		692		0.103		0.92		9567		911		1603	
2008	2.643	3.45	284	4.65	750	8.26	0.110	6.93	0.92	0.00	10012	4.65	1019	11.90	1769	10.33
2009	2.746	3.87	291	2.72	800	6.70	0.117	6.27	0.92	0.00	10285	2.72	1112	9.16	1912	8.12

Endog.: endogenous = result of calculations; Exog.: exogenous = assumption (input to calculations). % = growth rates. For further annotations: see text.

Source: Excerpt from Table 10.

The above results were calculated at the beginning of 2008. Assume now, time has passed and *we are in early 2009*, calculating the capitation for 2010. We will then have statistical information on the cost structure of the health providers in 2008 (Table 8) and on the actual development of wages and the other cost components in hospitals, as well as statistical information on price developments (CPI, electricity CPI, medical CPI) in 2007/08.

Let us assume the information is as follows (Tables 15 and 16):

Table 15.   Provider cost structure

Providers Cost components	Code	FY2007 (%)	FY2008 (%)
Salaries	L11	30	33
Temporary wages	L12	5	5
Incentives & compensations	L2	16	17
Medicine	MC1	29	29
Utilities	MC2	3	3
Other medical costs	MC3	<u>16</u>	<u>13</u>
TOTAL		100	100

FY = Fiscal year; sum-difference with 100 due to rounding of original values.

Source: ILO (example values).

Table 16.   Provider cost development

Providers Cost inflation indicators	Code	FY2007 (%)	FY2008(%)
Government salaries	L11	6.0	12.0
Temporary wages	L12	6.0	10.0
Incentives & compensations	L2	0.0	10.0
Medical CPI (sub-component CPI)	MC1	0.5	1.5
Electricity CPI (sub-component CPI)	MC2	1.5	2.5
CPI	MC3	2.3	4.0

FY = Fiscal year. % = growth rate.
Source: ILO (example values).

In other words, the differentials to the forecast made at beginning of 2008 are as follows (Tables 17 and 18):

Table 17.   Provider cost structure – differentials in percentage points between projections and results

Providers Cost components	Code	FY2007 (%)	FY2008 (%)
Salaries	L11	0	+3
Temporary wages	L12	0	0
Incentives & compensations	L2	0	+1
Medicine	MC1	0	0
Utilities	MC2	0	0
Other medical costs	MC3	0	-3

FY = Fiscal year.
Source: Difference between values (FY2008) in Tables 15 and 8.

Table 18.   Provider cost development – differentials in percentage points between projections and results

Providers Cost inflation indicators	Code	FY2007 (%)	FY2008 (%)
Government salaries	L11	0	+1
Temporary wages	L12	0	-1
Incentives & compensations	L2	0	+10.0
Medical CPI (sub-component CPI)	MC1	0	+1
Electricity CPI (sub-component CPI)	MC2	0	+1
CPI	MC3	0	+0.6

FY = Fiscal year.
Source: Difference between values (FY2008) in Tables 16 and 9.

Let us ignore the possibility that the information for FY2007 also changes.

Furthermore, by the beginning of 2009, we will have learned from statistics that in FY2008:

- the number of OP contacts was not 2.643   but   2.650; that

- the unit costs were not 284 Baht per contact   but   291 Baht; that

- the number of admissions was not 0.110   but   0.109, that

- the case mix index was not 0.92   but   0.95; and that

- the DRG base rate was not 10,012 Baht   but   9,800 Baht.

As a result of the additional information, the composite inflation rate for 2008 would not be 4.65 per cent (as assumed for the capitation budgeting process 2009) but 7.23 per cent.

As a result of this new composite inflation rate for 2008, when it is applied to the calculation of capitation, the table of calculations would look as follows (Table 19):

Table 19.   **UC capitation estimation**

Year	Endog. ur^{OP} Number of contacts p.a.	Exog. w^{UR} %	Endog. uc^{OP} Baht per contact	Exog. wUC %	Endog. Annual cost OP Baht	%	Endog. ar^{IP} Number of admissions p.a.	Exog. wAR %	Endog. CMI Index	Exog. wCMI %	Endog. b^{DRG} Baht	Exog. wDRG %	Endog. Annual cost IP Baht per member	%	Endog. Annual cost OP & IP Baht per member	%
Column	1	2	3	4	5= col1*col3		6	7	10	11	8	9	12= col5*col8*col10		13= col5+col12	
2007	2.555		271		692		0.103		0.92		9567		911		1603	
2008	*2.650*	*3.71*	*291*	*7.23*	*770*	*11.20*	*0.109*	*5.82*	*0.95*	*2.80*	*10258*	*7.23*	*1062*	*16.64*	*1832*	*14.29*
2009	2.755	3.95	299	2.82	823	6.88	0.116	6.42	0.98	3.00	10547	2.82	1197	12.71	2020	10.26
2010	2.865	4.00	308	3.00	882	7.12	0.122	5.50	1.01	3.00	10864	3.00	1340	11.92	2222	9.97
2011	2.979	4.00	317	3.00	944	7.12	0.129	5.50	1.04	3.00	11190	3.00	1500	11.92	2444	10.02
2012	3.099	4.00	326	3.00	1012	7.12	0.136	5.50	1.07	3.00	11525	3.00	1679	11.92	2690	10.07

Endog.: endogenous = result of calculations; Exog.: exogenous = assumption (input to calculations). % = growth rates. In *bold italics*: assumed statistical results.

Source: ILO (example).

The differentials between the projections made at the beginning of 2008 and 2009 (with new information about 2008) are depicted in the following table (Table 20):

Table 20.   UC capitation estimation - differentials

	Endog.	Exog.	Endog.	Exog.	Endog.		Endog.	Exog.	Endog.	Exog.	Endog.	Exog.	Endog.		Endog.	
Year	ur^{OP}	w^{UR}	uc^{OP}	wUC	Annual cost OP		ar^{IP}	wAR	CMI	$wCMI$	b^{DRG}	$wDRG$	Annual cost IP		Annual cost OP & IP	
	Number of contacts p.a.	%	Baht per contact	%	Baht	%	Number of admissions p.a.	%	Index	%	Baht	%	Baht per member	%	Baht per member	%
Column	1	2	3	4	5= col1*col3		6	7	10	11	8	9	12 = col5*col8*col10		13= col5+col12	
2007																
2008	*0.007*	*0.26*	*7*	*2.57*	*20*	*2.94*	*-0.001*	*-1.10*	*0.03*	*2.80*	*246*	*2.57*	*43*	*4.74*	*64*	*3.96*
2009	0.009	0.08	7	0.10	23	0.18	-0.001	0.15	0.05	3.00	263	0.10	85	3.54	108	2.14
2010	0.023	0.50	8	0.00	29	0.52	-0.002	-0.50	0.08	3.00	271	0.00	125	2.74	154	1.86
2011	0.038	0.50	8	0.00	35	0.52	-0.002	-0.50	0.11	3.00	279	0.00	174	2.74	209	1.90
2012	0.054	0.50	8	0.00	43	0.52	-0.003	-0.50	0.15	3.00	287	0.00	231	2.74	273	1.94

Endog.: endogenous = result of calculations; Exog.: exogenous = assumption (input to calculations). % = growth rates. In *bold italics*: differential between tables 19 and 10, i.e. of projection and assumed statistical results (example).

Source: ILO.

In other words, under the (assumed) new information on actual developments in 2008, a hypothetical new budgeting of the capitation rate for FY2009 would result in 2020 Baht per capita (instead of 1912 Baht, which, in this example, is the rate fixed for the budget FY2009 (Table 19)).

The question is now how to take this information into account for the projection (budgeting) of the capitation estimation for FY2010. There are two main possibilities:

(1)   The legally fixed capitation rate for 2009 of 1912 Baht (Table 10) is used as the basis on which the 2010 capitation rate is calculated by multiplying the 2009 legally fixed rate by 1.0997, which is the growth factor resulting for 2010 on the basis of the *new* statistical information in 2008 (Table 19, column 13).

In this case, the rate for 2010 would be 1912 * 1.0997 = 2103 Baht per capita.

Or:

(2)   The legally fixed rate for 2009 is ignored and a fresh calculation using the new statistical information for 2008 is calculated to arrive at a new hypothetical rate for 2009 that serves only as an interim result to budget the rate for 2010. In this case the rate as calculated in Table 19 (column 13) would be used, which amounts to 2222 Baht per capita.

The difference between the two estimation procedures is quite remarkable; however, it is evident that in the long term they produce very similar results, as long as the projection (budgeting) process always refers back to periodically provided statistical results correcting for past projection errors stemming from flawed base year estimates and wrong exogenous assumptions.

In order to maintain good relations between the NHSO and the BoB, it is important to agree on one of the two methods, although the result in the above example is purely hypothetical. There are many possible combinations of information and accordingly revised assumptions which produce different results, including where the first method produces higher capitation amount than the second (i.e., based on other assumptions, one could generate an inverse result). The decision as to which method to use should therefore be based on a multiple of control calculations, and should be agreed upon among the BoB and the NHSO. Once agreed, however, both sides should stick to the chosen method in

order to provide planning security to all stake olders in the budgeting process (including patients, UC members, and providers).

In order to establish budgeting based on mutual trust, it is imperative that the NHSO *maintains* regular annual (and quarterly) statistics, and makes them available to the BoB. The BoB should fully participate in the assumption setting process for the calculations to be made in order to fix the rate for future budgets.

It should be added that in the long run, capitations are not independent of the start values. When fixed for a given budget year t, capitations might influence utilization rates and costs in t, which, in turn, may impact upon the (required) capitation in budget year t+1. In the case of a positive correlation between budgeted capitation and providers' "cost behaviour", *methods producing higher initial capitations might result in higher utilizations and costs later than methods resulting in lower initial capitations*. In other words, the methods that were used at the beginning of the capitation process might impact upon on the overall financial situation of Thailand's health system in the long run.

It is therefore always necessary to carry out capitation projections in a medium-term budgeting context of about 5 years in order to be able to assess and interpret short-term fixed capitations in a longer term context of general economic and budget evolvement.

It must be reiterated that the proposed revolving error analysis is only meaningful in cases where sufficient provider cost statistics are available.

3.2.2. SSO – proposals for improvement of the budgeting process

The SSO must redirect its annual budgeting policies towards risk adjustment (which it currently only does to a limited extent). In practice such policy redirection means adopting two core procedures:

(1)   Increasing the relative amount of the budget covered by global capitation. By its basic meaning, this is going back to original capitation policies as applied at the very beginning of the SSO;

and:

(2)   Paying providers, at least for in-patients, according to a DRG system, i.e. risk adjusted.

Step (1) is of only limited use without step (2) and step (2) is difficult to attain without offering a higher global in-patient budget to hospitals through step (1).

Moves in this direction would be in line with the approaches used by the UC since its inception but also by the CSMBS, which has introduced a DRG-based payment system since 2007/2008. Policies being "in line" with UC and CSMBS does not mean they should be identical with each other. The SSO would be able to maintain its organizational independence and it would also still be able to pursue its own "benefit package" policy with respect to its members. With respect to such a combined capitation-DRG approach the SSO would still have to make a crucial choice: whether to opt for a closed-end budget approach (like the UC), or whether to negotiate a DRG base rate annually with the providers. In the first case SSO would essentially maintain tight budget control at the expense of potentially sub-optimal treatment for its members and of potentially difficult annual negotiations with the providers about the base rate. In the second case, cost control would be shared between the SSO and providers, with some strategic disadvantage for the SSO: after fixing the base rate (in negotiations between the SSO and providers), providers would be able to maximize income through making use of the flexibility inherent in DRG-

coding at hospital level. Some of that flexibility, however, might be to the strategic advantage of the SSO covered population (patients).[42]

Once the SSO has switched to the new payment mechanism as proposed in this report, they w/could use the same global budgeting *method* as the NHSO (Chapter 3.3.2).

Using the same method does not (and *must not*) mean the use of the same database and/or assumptions. It does, however, imply using the same statistical indicators as cost-drivers, possibly adjusted to specific circumstances governing SSO-contracted providers, i.e. their wages, medical and capital costs, etc. The same method also implies that a similar budgeting rhythm would be applied, possibly with some lag as the SSO budget year starts/ends three months later than that of the UC and the CSMBS.

Switching to a DRG-based payment system combined with a revised budgeting process, as briefly outlined, offers the SSO the option of switching from a pure "purchaser" role (seeking to buy services for members at minimal costs) to a role that includes health system management. If the SSO and the CSMBS, together with the NHSO, use the proposed mechanism effectively, they can become a powerful force in the country helping to make Thailand's health system *in practice* more accessible to the country's population. Not only could such strong combined purchasing power have an enormous impact on the quality and quantity of services as currently delivered, but it would also enhance general and specific access to health services by having a combined approach (government and private sector) to determining investments in the health sector.

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[42] It should be pointed out that in the long run, i.e. after a transition and gradual adjustment period of 10 to 12 years, DRG base rates for all Thai hospitals should become identical.

4. Allocating the global budgets

Each of the three schemes (capitation plus cost per case for the SSO, fee for service for the CSMBS, and capitation plus 'capped DRG' for the UC) use different budget calculations and payment mechanisms to providers and start at different times and with different target beneficiaries.

In this chapter the existing allocation procedures will be outlined followed by proposals for improvement.

It must be mentioned that, in the context of the HCRP, proposals for improvement actually cover two dimensions (see also Chapter 4.2).

The first dimension is the allocation of globally available resources to specific programmes at the national level ("horizontal dimension"). In this respect, the issue of allocating the proper amount of monies to primary care plays a prominent role. Technically, i.e. in terms of model projection and allocation to regions, provinces, districts, and hospitals, the issue is of a "simple" nature, however it depends on a clear definition of primary care. The definition should allow for handling the respective monies in a budgetary (and modelling) context. At the time of the finalization of this report, the required definition (political decisions) had not yet been taken.

The second dimension is the improvement of mechanisms related to the allocation of globally available resources to the regions, provinces, hospitals, etc. The focus of the remainder of the report is on this second dimension ("vertical dimension").

The concrete reform proposals are based partially on findings of a consultancy mission of two key experts in the field, Professor Roy Carr-Hill and Mr. Stephen Campbell, both of the United Kingdom. Professor Roy Carr-Hill works at the University of York, and Mr. Campbell works in the British National Health Service, Leeds. It should also be mentioned that, given the complexity of capitation procedures in their concrete application, there is no once-and-for-all solution. On the contrary, capitation will (have to) be permanently adjusted to new circumstances, information and policy directions. Given this background, the issue will have to be dealt with on a permanent basis in the national Thai context. At the time of the finalization of this report Dr. Supasit Pannarunothai and Mr. Kanchit Sooknark, both of Naresuan University, were working on a new proposal on the future direction of capitation policies in Thailand.

4.1. Present procedures [43]

Present procedures differ between the three schemes (CSMBS, NHSO, and SSO).

The CSMBS follows a pure fee-for-service payment mechanism, with some soft DRG-based payment mechanism adjustments most recently made. These adjustments allow for a different DRG base rate for each hospital, and no policy towards unifying these rates to only one for all hospitals has as yet been formulated.

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[43] See also: Hennicot, Jean Claude: Development of a Health Care Financing Model. Initial Phase. draft mission report 1, 16 October 2007, p.4, in ILO/Thailand Report 7: *A Common Health Care Financing Model for the main health purchasing agencies: Universal Coverage Scheme, Social Security Scheme, and the Civil Servants' Medical Benefits Scheme; Documentation of work and progress,* under ILO/EU project: Financial Management of the Thai Health Care System (THA/05/01/EEC).

The SSO pursues a policy of austere capitation plus reimbursement to providers of costs per case ("add-ons", i.e. a fee for service approach).

The UC (NHSO) applies capitation plus a 'capped DRG'.

There are significant differences between the three schemes in terms of payment mechanisms, but also in terms of payment levels. There are historical reasons to explain these differences; they are also due to the fact that Thailand took steps towards full coverage of the whole population at different development stages.

The CSMBS is the oldest scheme and it was initially implemented for a relatively small group of civil servants and their dependents (children and parents alike). The scheme resembles an employer scheme which considers health provision as part of the employee remuneration package.

The SSO was implemented in 1991 when hospitals were financed still essentially by public monies and private out of pocket payments and information technology was still in many respects in its infancy. At that time, and even in hindsight, a simple capitation method (equal amount paid to providers for each SSO member registered) was considered adequate as SSO capitation meant "fresh money" to providers. In other words, in the beginning, the cash flow of the hospitals was significantly improved by the SSO. In order to avoid hospitals building up undue monetary reserves, the SSO administration pursued (and continues to do so) a very tight capitation adjustment policy (see above).

The UC, at the time of its implementation (2001/2002), was in a better situation for three reasons. Firstly, it was able to learn from the SSO experience. Secondly, in the meantime, information technology had developed to a degree that allowed for the handling of mass data at relatively low costs. Right from the beginning (i.e. without a long implementation phase), the UC administered over 45 million persons registered with close to 1000 hospitals. Thirdly, having had experience with the SSO, many providers (hospitals) had become accustomed to and acquired practice in routine operational reporting.

4.1.1. Allocating NHSO resources

Currently, the budget of the NHSO (which manages the UC scheme) comprises the following allocation headings ("budget lines"):

1   Expenditure for outpatient care (OP);

2   Expenditure for inpatient care (IP);

3   Expenditure for emergency medical services (EMS);

4   Expenditure for disability health care services (DIS);

5   Expenditure for capital replacement (CAP);

6   Expenditure for the settlement of medical malpractice claims (MC); and

7   Expenditure for disease prevention and health promotion services (PP).

Chart 7 shows an overview of the current allocation procedures.

Total per capita expenditure is allotted to the different budget lines, and then allocated to different service categories under hospitals' (providers') out- and in-patient treatments.

The amount of money going to the different providers is determined by the number of persons registered and the number of DRG-weights "produced".

The remaining five items outlined above (items 3 through 7) are being managed directly by the NHSO, at HQ-level, in Nontaburi, Thailand.

Chart 7.   UC - current funding system. Budget development and allocation
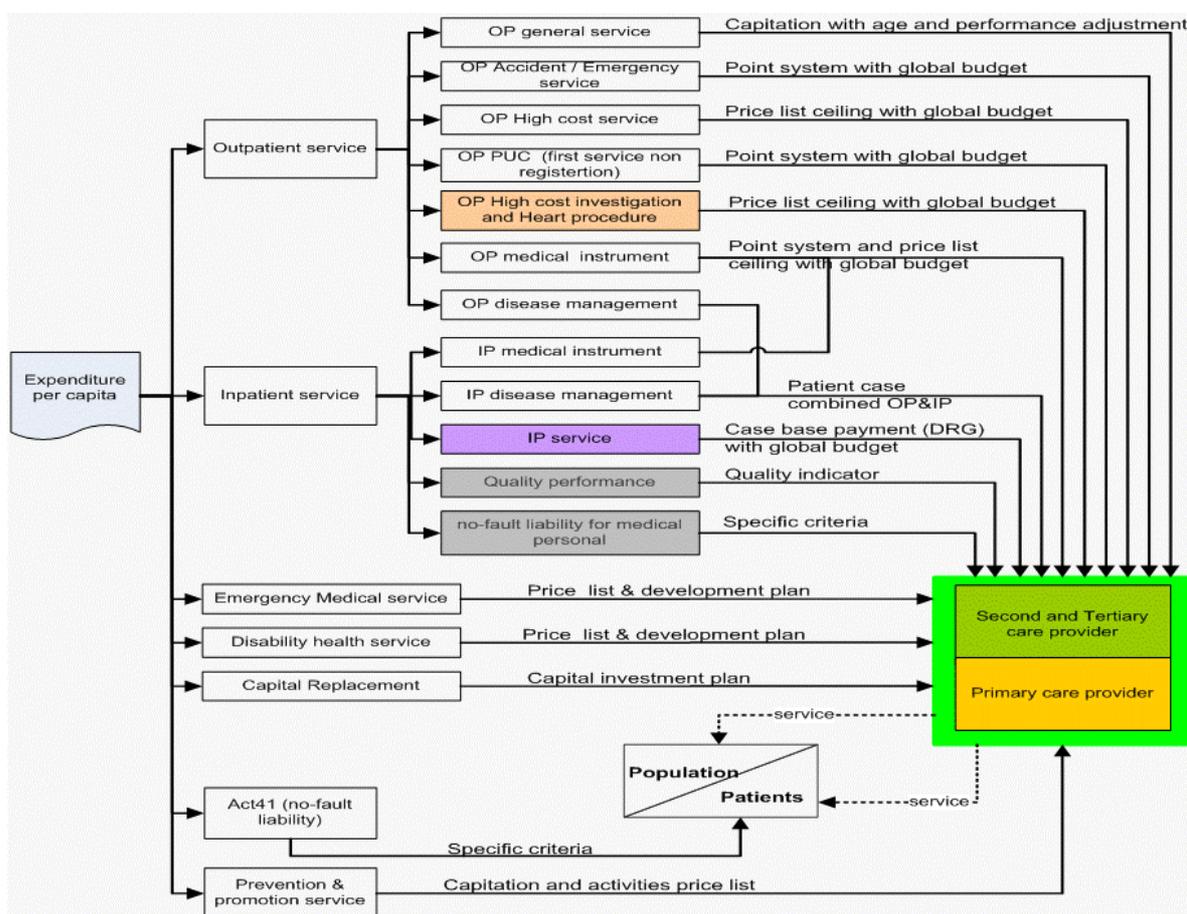
The capitation calculation method currently applied takes into account structural expenditure differentials between provider types. [44]

Expenditure for *outpatient general service*

This item of expenditure is based on age-adjusted capitation.

Expenditure for *outpatient accident and emergency care*

This item of expenditure relates to outpatient services under accident and emergency conditions which other providers provide out of contracted services for UC members.

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[44] A distinction is currently made between three types of providers (PCU, district hospital, and general hospital). No conclusion has yet been found as to whether a further breakdown of those categories would be useful in the future, and if so, how the new provider categories should be defined.

Expenditure for *outpatient high cost services*

> This item of expenditure is for specific high cost treatments, procedures or drugs such as chemotherapy and hemodialysis.

Expenditure for *medical care provided to non-registered persons (NR)*

> This expenditure item relates to the medical care provided to non-registered persons entitled to care under the UC.

Expenditure for *outpatient high cost investigations*

> This item is set up to budget for some expensive investigations.

Expenditure for *medical instruments*

> This expenditure item relates mostly to artificial prostheses for both inpatients and outpatients.

Expenditure for *"Disease Management"*

> This category of expenditure is for specific diseases such as leukemia, hemophilia, and cardiac surgery. The terms and conditions of payments differ with each disease.

Expenditure for *inpatient care*

> This expenditure item is set up for the global budget for inpatient care, which uses the Relative Weight of DRG to allocate the amount of money paid to hospitals.

Expenditure for *quality performance*

> This item of expenditure relates to any additional payments a health care provider may receive, if they reach NHSO-set targets.

Expenditure for the *settlement of 'no fault liability' compensation for medical personnel*

> This category of expenditure is for payments to patients as compensation for injuries caused by medical personnel or illnesses arising from medical practice.

Expenditure for *emergency medical services* (EMS)

> This item of expenditure relates to emergency medical transportation (ambulance services) and related communication. Emergency medical transportation is coordinated and sometimes operated under provincial administrations. The NHSO distinguishes between three different levels of service, which are reimbursed according to a given fee schedule.

Expenditure for *disability health benefits* (DIS)

> This category of expenditure is for medical appliances (prostheses) provided to insured persons by UC-contracted providers. It excludes medical OP- and IP-services which are included under the OP and IP expenditure items. DIS are currently disbursed according to a fee schedule.

Capital replacement and investment expenditure (CAP)

> This expenditure item relates to expenditure incurred by contracted hospitals for capital investment (upgrading) and capital replacement (e.g. hospital facilities, medical instruments, equipment, etc.).

Expenditure for the *settlement of medical malpractice* claims (MM)

> This item is set up to include payments to patients for medical malpractice.

Expenditure for *preventive care and health promotion* (PP)

> This category of expenditure covers activities aimed at disease prevention and health promotion for the whole resident population. Some PP activities target specific population age groups (e.g., vaccination programmes) and/or are gender-specific programmes (e.g., breast cancer screening).

Payments for inpatients

> The inpatient budget reflects all services to patients admitted to hospital for inpatient stay. Each case is coded on the day of discharge, the code being submitted to NHSO for calculation of the relative weight of DRG. The total budget for inpatients is allocated quarterly based on the accumulated relative weights of DRGs.

Payments for outpatients

> The outpatient budget is more complicated. Due to the fact that health care is generally centralized in a hospital setting, the term 'outpatient' refers to patients who access ambulatory care in:

> • a Primary Care Unit (PCU), in which services are usually provided by nurses or other health care personnel;

> • a Community Medical Unit (CMU) in which services are usually provided by doctors, nurses and other health workers;

> • a community hospital;

> • a general hospital outpatient department; or

> • a tertiary care hospital outpatient department.

> There is currently no distinction in budgetary terms between patients who require specialists' outpatient consultations and those who use the hospital outpatient departments for primary care diagnostic and treatment services.

> For calculation purposes:

> • the OP budget for the year t+1 is allocated as follows:

>> 1.1 The budget for general OP care is allocated to provinces based on:

>>> o *Age structure of the population insured in the province* (90 per cent of the total amount). For allocation by age structure, different weights (taken from IHPP research) are applied for 7 different age groups (0-4, 5-9, etc.).

o   *Utilization history* (previous quarter(s)) in the province (10 per cent of the total amount). This is calculated by dividing the total number of contacts reported in each province by the total number of contacts reported for all provinces.

1.2   The budget for add-on items is divided by the number of cases reported and disbursed accordingly to each hospital. Payment is made prospectively and adjusted retrospectively on the basis of actual utilization.

1.3   There is no ceiling on the budget for OP investigations (laboratory and diagnostics) and OP heart interventions. This is paid quarterly as flat-rate according to reported cases and payment is made prospectively and adjusted retrospectively on the basis of actual utilization.

- The IP budget for the year t+1 is allocated as follows:

2.1   The budget for general IP care (paid by DRG $A_{djusted}RW$) is allocated to 13 different regions (NHSO branch offices) based on the projected number of admissions in each region. For each region and quarter, the base rate (payment per ARW) is calculated by dividing the quarterly regional budget by the regional number of ARWs. The payment is based on projected ARWs and adjusted retrospectively (six months later) on the basis of actual experience.

2.2   The closed-end budget for IP add-on payments (based on reported charges) is allotted on a monthly basis (annual budget divided by 12) (subject to a ceiling fixed for each benefit).

2.3   There is no ceiling on the budget for IP disease management. Payment for all benefits is based on a fee schedule. (The total amount is small hence risk can easily be absorbed.)

For a full understanding of the procedure, it must also be stated that the budget allocation process is *virtual* in the sense that NHSO calculates the budget and allocates funds to hospitals on the above basis, but it has relatively little knowledge of the extent to which the hospitals actually spend the monies received on the items (programmes) budgeted for. In other words, there is no (statistical) feedback between purchaser (NHSO) and provider (hospitals) and, thus, no possibility for cost-control activities. This situation is unsatisfactory. In the case of the SSO, the situation is slightly better (see below).

4.1.2. Allocating SSO resources

The capitation fee is negotiated annually by the SSO Medical Committee. At present, the payment mechanism for providers that have contracted with the SSO consists of the following:

1.   A flat-rate capitation fee is used for general OP and IP care;

2.   A top-up to capitation referred to as a 'utilization incentive' is used for both OP and IP in order to account for utilization rate differentials across providers;

3.   A top-up to capitation referred to as 'risk adjustment' is used in order to account for cost differentials for IP (based on DRG $A_{djusted}RWs$) and chronic diseases;

4.   A case-by-case payment method is used for selected high-cost treatments, consisting of fee-for-service reimbursements up to defined ceilings which vary with each treatment. Treatments classified as high cost include the following:

- Chemotherapy and radiotherapy;

- Open heart surgery;

- Brain surgery;

- Medical implants;

- Coronary bypass;

- Percutaneous balloon valvuloplasty;

- Cryptococcal meningitis;

- Coronary dilatation using balloon or PTCA bypass;

- Atrial septal occluder; and

- Sterilization (male & female).

The benefits are reimbursed separately up to a ceiling, the amount of which is fixed specifically for each treatment. The ceilings on reimbursements are adjusted occasionally and no timetable has been set for regular adjustments;

5. A case-by-case payment method is used for accident/emergency cases for insured persons that are not registered with the provider. This payment consists of a capped fee-for-service reimbursement for public hospitals and a full fee-for-service reimbursement for private hospitals, both according to a fee schedule;

6. A case-by-case payment method (capped fee-for-service) is used for other specific items, including the following:

- HIV/AIDS (drugs and diagnostics);

- dental care;

- bone marrow transplantation;

- hemodialysis;

- kidney transplant; and

- cornea transplant.

In 2006 this allocation mechanism produced the results shown in Table 21, which shows the total amount by cost item disbursed to SSO medical providers.

Table 21. SSO - medical expenditure by cost item, 2006

Item		Baht	Allocation (%)
1	Basic capitation fee	11,377,809,430	72.1
2	Utilization incentive	500,194,335	3.2
3	Risk adjustment for capitation	1,865,960,745	11.8
4	High cost special services	270,598,524	1.7
5	Accident/emergency care	344,708,914	2.2
6	Dental care (pulling, filling & scaling)	591,646,090	3.7
7	HIV/AIDS (drugs & diagnostics)	449,454,053	2.8
8	Bone marrow transplantation	9,750,000	0.1
9	Hemodialysis (visits)	353,121,159	2.2
10	Kidney transplant	19,037,928	0.1
11	Cornea transplant		
	TOTAL	**15,782,281,178**	**100**

Source: SSO.

It is observed that the basic capitation fee would have had to have been topped-up by 40 per cent in order to cover all other cost items.

In order to assess the scope and adequacy of the two risk adjustment components of the capitation fee (items 2 and 3 above), a comparison was undertaken between the capitation payment and the reported hospital charges. The total charges reported by SSO contractor hospitals are shown in Table 22.

Table 22. SSO - Hospital charges reported for OP and IP care, 2006

Category	Total charges (Baht)	Allocation (%)	
		Including	Excluding
		High cost items	
Outpatient care			
General OP care	7,365,466,773	42.9	43.6
OP care for chronic patients	2,405,522,746	14.0	14.2
OP high cost care	72,870,010	0.4	
Total	**9,843,859,529**	**57.4**	**57.8**
Inpatient care			
General IP care	6,399,819,151	37.3	37.9
IP care for chronic patients	731,741,332	4.3	4.3
IP high cost care	180,054,730	1.0	
Total	**7,311,615,214**	**42.6**	**42.2**
GR TOTAL	**17,155,474,742**	**100**	
GR TOTAL excl. High Cost	**16,902,550,002**		**100**

Source: ILO calculation based on data provided by SSO.

After exclusion of high cost items (reimbursed separately), total hospital charges reported for SSO OP and IP care amounted to 16.9 billion THB, of which 57.8 per cent were allocated to OP care and 42.2 per cent to IP care.

The total capitation amount paid in the year 2006, broken up by cost category, is shown in Table 23.

Table 23.   SSO - capitation amount by component, 2006

Item	Sum of capitations (Baht)	Capitation (Baht per capita)	Allocation (%)
Basic capitation fee[(1)]	*11,377,809,430*	*1,250*	*82.8*
Basic OP*	6,087,986,677	669	44.3
Basic IP*	5,289,822,753	581	38.5
Utilization incentive	*500,194,335*	*55*	*3.6*
For OP care	339,790,032	37	2.5
For IP care	160,404,303	18	1.2
Risk adjustment	*1,865,960,745*	*205*	*13.6*
For chronic diseases[(2)]	1,026,278,410	113	7.5
OP chronic*	786,907,317	86	5.7
IP chronic*	239,371,093	26	1.7
For IP (based on DRGs)	839,682,336	92	6.1
TOTAL (excl. HC)	**13,743,964,510**	**1,510**	**100.0**

[(1)] Broken up in OP/IP based on the ratio of reported charges for non-chronic OP and IP care. [(2)] Broken up in OP/IP based on the ratio of reported charges for chronic diseases.

Source: ILO calculations based on data provided by SSO.

A comparison between the relative share of hospital charges by category and the allocated share of the capitation rate is summarized in Table 24.

Table 24.   SSO - Comparison of capitation allocation with hospital charges, 2006

Item	Sum of charges	Sum of capitations
	Allocation in %	
OP care (non-chronic)	43.6	46.8
Basic rate		44.3
Utilization-rated supplement		2.5
IP care (non-chronic)	37.9	45.8
Basic rate		38.5
Risk-rated (DRGs)		6.1
Utilization-rated supplement		1.2
Chronic diseases	18.6	7.5
OP chronic	14.2	5.7
IP chronic	4.3	1.7
Total	**100**	**100**

Source: SSO data and ILO calculations.

The following can be observed:

➢   General OP care (non-chronic) represented 43.6 per cent of total hospital charges and this was matched with an estimated 46.8 per cent allocation of the total capitations. Only 5.7 per cent (2.5 per cent points) of the total amount provided for general OP care was risk adjusted for utilization differences.

➢   IP care (non-chronic) represented 37.9 per cent of total hospital charges and this was matched with an allocation of 45.8 per cent of the total capitation. The allocation for risk differentials (based on utilization and DRG weights) represented only about 16 per cent of the total capitation allocated to IP care.

➢   The cost of chronic diseases represented 18.6 per cent of total charges but only met an allocation of 7.5 per cent of the total capitation amount.

> ➢ The level of risk rating applied in the current capitation allocation method is low. The two components of the capitation fee compensating providers for risk differentials account for only 17.2 per cent of the total capitation amount.

> ➢ It is unclear upon which factual basis the levels of the components of utilization and risk adjustment are set.

> ➢ The long (and increasing) list of fee-for-service reimbursement items in the SSO benefit list indicates strong pressure from providers to take out increasing numbers of benefits from general capitation, which can be attributed to the fact that the current capitation system does not give sufficient weight to risks caused by utilization and treatment cost differentials among SSO members.

> ➢ The DRG system currently in place for IP care provides a comprehensive and fair risk rating system for IP care. In 2006 however, only 16 per cent of IP capitation monies were disbursed for the compensation of risk/cost differentials reported with the DRG system.

4.1.3. Allocating CSMBS resources

The CSMBS has recently (2007/2008) started a payment mechanism that uses DRG relative weights with DRG base rates which vary between hospitals. In the future, it is expected that the government will implement a process that leads to a unification of base rates (or at least unified base rates for clusters of hospitals facing similar risks).

Since 2006/2007, the CSMBS has also introduced a direct payment mechanism for outpatients which replaces the traditional system where civil servants (or their dependents, respectively) had been reimbursed cost on the basis of individual claims (bills).

4.2.   Structuring the allocation problem

The allocation problem to be solved has two aspects. The first aspect relates to changes in the amounts to be allocated amongst the different programmes of the global (national) budget - we call it the "horizontal" dimension. The second aspect relates to the problem of providing all hospitals with a "fair share", and at the same time taking into account the needs of the UC covered population and the financial (cost) requirements of the providers; we call this the "vertical" dimension.

The horizontal structure of the allocation problem

Two Thai government strategies aim to shift the focus of outpatient care for the majority of patients away from hospitals and into the community, ambulatory care setting. The Primary Care Strategy [45] and the Hospital Downsizing Policy both support the improvement of primary care services at the community level in terms of availability, accessibility and types of services provided. This would also serve to reduce the numbers of patients accessing services at the secondary care (hospital) level. It is being reported, but it is not possible to prove statistically, that 80 per cent of patients presenting themselves at

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[45] The Decade of Cooperation in Development of Community Health System. Phase 1: Strategic Plans for cooperation in development of primary care system to community health system 2007-2011.

hospital outpatient departments do not clinically need to be there. They do not need specialist consultations and could be provided with more appropriate clinical care at a primary care level in the community if services were available and accessible.

In order to make this happen, the government's intention is to make a distinction between primary care services and secondary services, with:

☐ Primary care services providing:

- illness prevention;

- health promotion;

- diagnosis;

- treatment;

- clinical management of chronic illnesses and diseases;

- referral to secondary care;

- screening for some preventable diseases;

- rehabilitation, and

- longer term community based care (such as end-of-life care);

and

☐ Secondary/tertiary care services, or hospital services, providing:

- specialists' outpatient or ambulatory services;

- inpatient services, and

- rehabilitation.

As a result, the structure of the provision of health services would look more like the "reform scenario" outlined in Chart 8.

Chart 8.   Primary care and secondary/hospital services
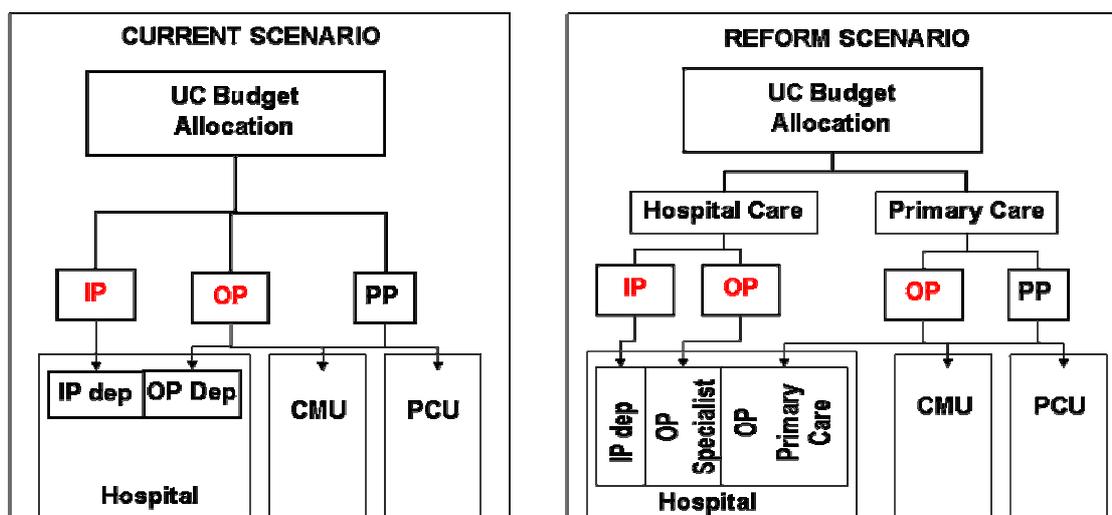
Source: Project Implementation Unit (PIU), HCRP, Thailand.

The calculation of the cost of primary care services has never been undertaken in Thailand before, since this is a new development. It should be noted that currently a significant part of primary care services are provided in hospitals, and time will be needed to completely separate primary care in an ambulatory setting and hospital care. Any solution to the horizontal structure of the problem will therefore have to include ways of demarcating specialist care and primary care in out-patient setting of hospitals.

Due to advances in medical technology, certain surgical procedures which previously required an inpatient stay can now be done on an outpatient or ambulatory basis. As a result of this, the demarcation line between inpatient and outpatient treatment is now becoming unclear. A new payment for ambulatory surgery (or day surgery) or other "high technology" outpatient investigations and treatment could be developed and allocated more appropriately according to resource and health needs.

These strategies and options require a shift in the way the health budget is developed and allocated at the national level. In particular, a strategy to implement primary care requires an explicit (re)allocation of resources in order to achieve the strategy as planned. The health financing model being developed by the ILO has the capacity to allocate resources to each of the main budget headings, however, for this to happen, the new structure of the national budget must be exogenously decided, must correspond to the intended policies, and must include a fully-defined transition period.

The vertical structure of the allocation problem

The vertical allocation problem concerns the allocation of nationally available resources (budget) to individual providers (hospitals), while at the same time taking into account providers' financial needs and patients' health (access) needs.

In the Thai context, the vertical resource allocation issue, i.e. the situation to be aimed at in future, can be structured as follows:

Chart 9.   Vertical resource allocation in Thailand
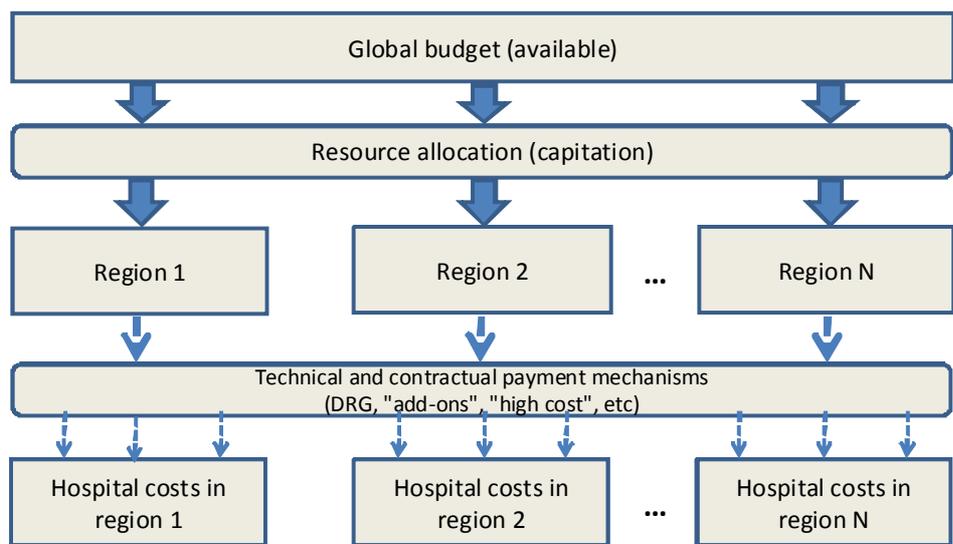
Source: Project Implementation Unit (PIU), HCRP, Thailand.

In this report we understand the resource allocation process to take place between the centre (total budget available at NHSO and/or at SSO) and the (15) regions – each region consisting of a various number of provinces such that the population to be included is allocated to the regions in "pools" of fairly equal size.

4.3.   Vertical resource allocation

Given the relatively good quality of Thai population statistics, [46] in the future, the process of allocating resources to regions should take into account the different population structures of the *regions*, by single age (or 5-year age groups), and sex (male, female).

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[46] In the context of this project, the consulting actuary, Mr J-C Hennicot, in close cooperation with the Thai authorities, undertook substantial cleaning of the earlier population data base of the MoI, which is also being used by the NHSO (UC).

Furthermore, the costs per contact per year of a selected number of allocation-significant diseases could be taken into account.[47] These diseases could be selected through a formal process as follows (Chart 10):

Chart 10.   Selection of diseases for risk adjustment of resource allocation
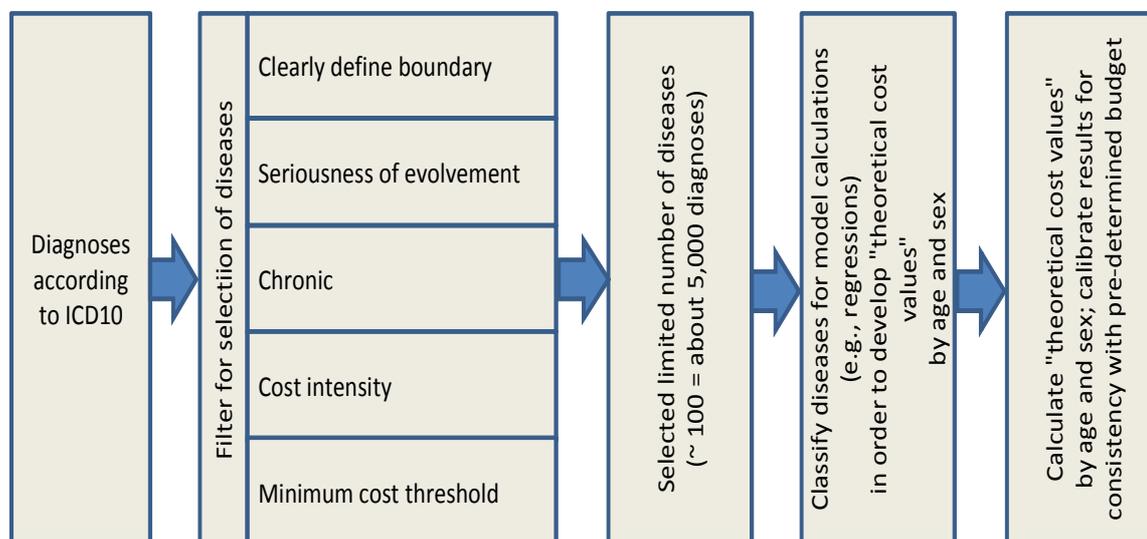
Source: Project Implementation Unit (PIU), HCRP, Thailand; adaptation of
http://www.bundesversicherungsamt.de/cln_091/nn_1046668/DE/Risikostrukturausgleich/Wie__funktioniert__Morbi__RSA,templat
eId=raw,property=publicationFile.pdf/Wie_funktioniert_Morbi_RSA.pdf (Abbildung 4)

Empirical information on costs per disease per contact must be collected through a nation-wide representative sample in the contracting hospitals (the sample may include non-contracting hospitals as these might be contracting-in later).

The above process (capitation by age and sex and limited number of diseases) would result in a matrix of 2,000 estimated "raw" capitations. These raw capitations would then have to be turned into "theoretical" capitation rates with the help of regression and smoothing techniques, including level-calibration, so that after multiplication with the numbers of scheme members and their respective utilization rates, the theoretical capitation rates are consistent with the globally available budget.

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[47] In other words, at this stage of development, it is not recommended to undertake a hospital census or hospital sample of the costs of the full range of diseases according to ICD10 (with more than 15,000 codes) which, given the present state of hospital accounting, would clearly exceed hospitals' reporting capacities.

Chart 11. **Matrix of 10 * 2 * 100 = 2,000 capitations** (example)

	Age group		Male				Female			
			Disease 1	Disease 2	...	Disease 100	Disease 1	Disease 2	...	Disease 100
			Capitations (shadow fees) in Baht per contact per year T							
1	00-09		Cap11	Cap12	...	Cap1100	Cap1101	Cap1102	...	Cap1200
2	10-19		Cap21	Cap22	...	Cap2100	Cap2101	Cap2102	...	Cap2200
3	20-29									
4	30-39									
5	40-49		...	...	...	...	...	...	...	...
6	50-59									
7	60-69									
8	70-79									
9	80-89									
10	90 and over		Cap101	Cap102	...	Cap10100	Cap10101	Cap10102	...	Cap10200

Source: ILO.

For example, in Chart 11, one could approximate the capitations in the 200 columns (diseases) by polynomial regressions of the type

$$U(age)_i = \alpha_i + \beta_{1,i} * age + \beta_{2,i} * age^2 + \beta_{3,i} * age^3 + \beta_{4,i} * age^4 + \beta_{5,i} * age^5 + \beta_{6,i} * age^6$$

where

$U(age)_i$ represents the capitation rate in age-group i (for each of the diseases), and

age^n is the middle of age group n, while

$\alpha_i, \beta_{n,i}$ represent parameters which, after estimation, can be used for calculating capitations by single ages, if considered necessary for proper allocation of resources to the regions.

In practice, many of the above capitations might statistically not differ significantly from each other; in other words, in practice the set of 2,000 rates may be very much reduced.

By the end of the estimation process, registered populations (under NHSO, SSO) would be sorted by age and sex and multiplied by their respective utilization rates and the (above) estimated capitations. Calibration procedures (numerical iteration) would ensure that the sum of the products add up to the pre-determined total global budget.

Example[1]: Calculating risk related capitation fees in practice

In this example, which is only of an illustrative nature, we assume that risk related capitation fees are to be calculated according to sex, age and prevalence of a selected number of diseases that are being considered as reflecting treatment costs significantly. The selected diseases are placeholders for the amount of all diseases treated (see also Chart 11). It is further assumed that there is no statistical system in place that would allow for a precise costing of the capitations, otherwise the following explanations would be unnecessary.

In such a situation, sample techniques could be applied in order to compile information about the treatment costs of the selected diseases depending on the age and sex of the patients. These samples would have to be taken at provider (hospital) level and usually there should be some minimum filing or other adequate cost-recording system in place that would support the sampling technique. Sampling results would have to be cross-checked by experts for plausibility and consistency. The poorer the sampling results, the more expert judgement must be added.

Alternatively, in the absence of sample information, calculation of capitations could be based solely on expert knowledge. Usually, professionals dealing with health costs can be expected to have a solid understanding of the costs occurring with the treatment of diseases (including by patients' age and sex). Delphi-techniques have been developed that allow for consistent compilation of experts' opinions (e.g. through the setting-up of an adequately designed "round table").

Assume now that the following information on treatment costs per year per case, in current prices, and utilization (frequency of contacts with the health system per year) differentiated by age, disease and sex, has been collected either through a sample or through expert opinion, or through a mixture of both (age is represented by the middle of ten age groups of equal width; the selected disease may be disease1 and the selected sex may be male):

Costs and contacts

Middle of age group	Treatment costs per patient per year	Contacts per year
	Currency	Number
5	10.0	5.0
15	6.0	1.0
25	2.0	1.0
35	1.0	1.5
45	1.0	1.5
55	2.0	3.0
65	7.0	6.0
75	12.0	10.0
85	24.0	10.0
95	36.0	8.0
	Total costs under sample: 757	

Applying the described polynomial regression to the above information results in two equations; one equation approximates the treatment costs per patient, the other approximates the contacts per year.

Equation for treatment costs:

$$U_1 (age) = 9.79 + 0.36age - 0.08age^2 + 0.00age^3 - 0.00age^4 + 0.00age^5 - 0.00age^6$$

Equation for contacts:

$$U_2 (age) = 13.4 - 2.40age + 0.17age^2 - 0.00age^3 + 0.00age^4 - 0.00age^5 + 0.00age^6$$

Note: In both equations, parameters to the variables age^n, $n > 2$, are significantly different from zero but very small. They have been rounded to "0.00" for easy reading.

With the help of these equations, it is possible to calculate capitations for single ages (in fact, the two equations provide a numerical smoothing technique). The numerical results of these calculations are not shown here, but are represented graphically in the following two separate charts.

**Chart 1.   Capitations after smoothing with formula "Equation for treatment costs"**
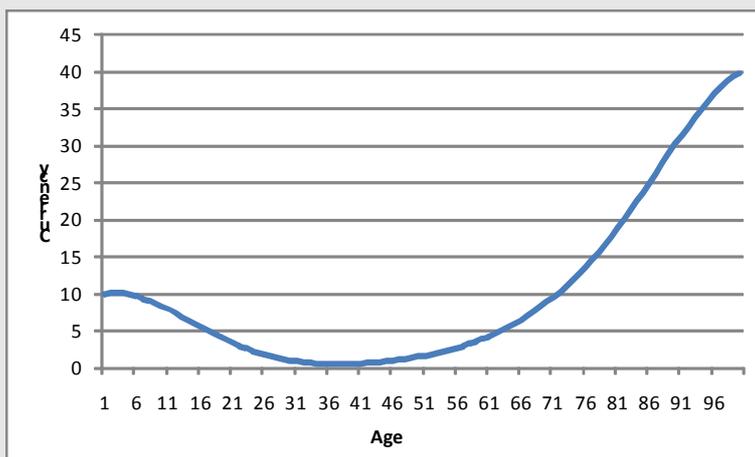
Chart 2.   Number of contacts after smoothing with formula "Equation for contacts"
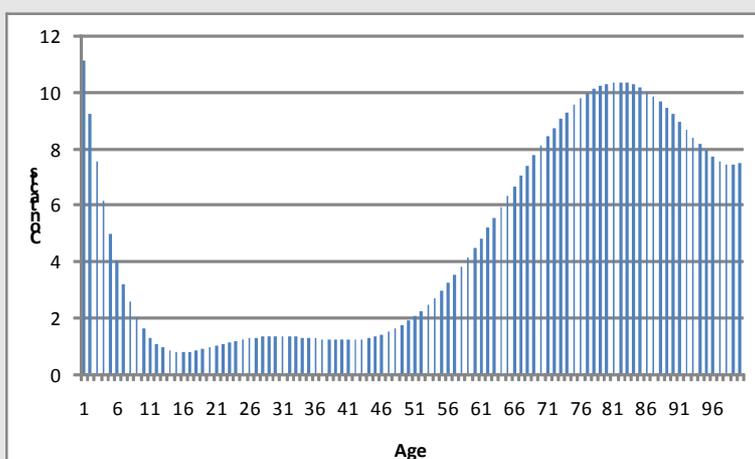
The sum product of the two vectors that contain the 100 values under the two components (cost, contacts) represents an estimate of the total costs, which, in the above case, amounts to 7773 Currency Units (CU). In the context of our example, this would be the total treatment costs of disease1 for men of all ages.

Usually, the estimate derived this way differs from the true costs, i.e. those costs registered in the accounts of the health system. Let us assume the true costs are 8000 CU (instead of 7773 CU). A proper procedure would then be to adjust the estimated capitations (assuming the number of contacts is correct) such that the sum product of the adjusted capitations and the number of contacts equals the true value (8000 CU).

This problem is of a numerical nature and can be solved by numerical iteration programmes, e.g. by applying the function *Solver* in Excel. This example gives an idea of how this could be done, however more calibration procedures might have to be applied.

In any case, capitations derived in this manner would be estimates. As they most probably deviate from their underlying unknown true values, one would not attach or expect too much meaningfulness from each single value, but only from the whole set of estimated single capitations, which set can be referred to as the capitation system. In other words, one should focus on the rationale of the capitation system as a whole, and not so much on each of the single values.

The practical applicability of the estimated capitation system would depend on its acceptance by all stakeholders of the health system, i.e. especially providers and purchasers. One essential prerequisite is full transparency of the estimation process. Furthermore, all stakeholders must be ready to accept that capitations, and more precisely the shape of the curves in the above charts, are being revised from time to time, e.g. every five years.

On this basis, (the shape of the curves temporarily unchanged) capitations could be adjusted annually according to indexation procedures such as described in this report or elsewhere.

[1] I am grateful to Mr Thomas Renner, Federal Ministry of Health, Germany, who inspired me to provide this example.

Advantages of the proposed vertical allocation process

The main advantages of the proposed approach would be that it (i) takes into account broad generally-accepted health demand indicators (age and sex); and it also (ii) takes into account indicators that simultaneously reflect health demand and health supply, i.e. the selected number and types of diseases. Diseases reflect the morbidity of the population, but they also reflect the costs of the providers in treating the diseases. In other words, once estimated, the capitation rates could be annually (linearly) adjusted to provider cost inflation.[48]

The proposed procedure would have several advantages:

(1) Regions, *independent* of their general income levels, would receive fairly similar amounts per capita of the (registered) population. This is because of the fact that it can be expected that treatment of diseases will cost relatively similar amounts per contact (if not, further investigations in hospital costing are due); in other words, the procedure implies (a welcomed) redistribution from relatively wealthy to relatively poor regions (persons).

(2) Regions would be given a certain degree of (contractual) freedom to deal with "their" providers according to their providers'/patients' specific needs, where necessary.

(3) Regions would know their revenue (budget), i.e. they have no income risk (i.e. they will have planning security). They would however face the expenditure risk, i.e. the risk that hospitals (wish to, have to) spend more than initially foreseen. Regional allocation of the budget would, however, offer regions the possibility of shifting resources between hospitals in need (deficit) and hospitals in surplus in a focused way.

(4) Allocation of resources to a limited number of regions (15) improves transparency with respect to regions that might require more funding.

Disadvantages of the proposed vertical allocation process

(5) The main disadvantage of the proposal is that it requires strong statistical support, unless all stakeholders would be willing to accept virtual (i.e. no data) estimation approaches to capitation (which is possible and could lead to acceptable results).

(6) A further disadvantage of the proposal is that, in order to fully function, hospitals need to be given much more independence in many areas impacting on the allocation procedure than is currently the case. Some specific examples of areas in which this independence is needed include giving more freedom to hospitals to contract with provinces, to specialize according to local needs, in questions of staffing (including budgeting for payment of staff), etc., and, on the negative side, the possibility to go bankrupt.

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[48] See ILO/Thailand Report 7: *A Common Health Care Financing Model for the main health purchasing agencies: Universal Coverage Scheme, Social Security Scheme, and the Civil Servants' Medical Benefits Scheme; User Manual.* Prepared in the context of ILO/EU project: Financial Management of the Thai Health Care System (THA/05/01/EEC).

5. Conclusions

On the basis of the findings of this report, it is proposed that the NHSO and the SSO continue, *for the time being*, with their respective established allocation routines, however when adjusting them to changing short-term requirements and policies, they must not lose sight of the general reform direction as explained.

A mission to Thailand undertaken by Professor Roy Carr-Hill, University of York (United Kingdom) in summer 2008, found that the present allocation indicators used by the NHSO are more or less in line with similar approaches around the world, implying that the NHSO is, at least, not heading in the "wrong" (i.e. not generally accepted, non-mainstream) direction. This also applies *mutatis mutandis* to the SSO, albeit less so.

The general consensus is that the NHSO is, in principle, on the right track.

At the same time, and in order to provide sustainable support to moves in the direction of the resource allocation proposals contained in this report, the ILO proposes to enforce the required statistical work. It is only through the use of a reliable statistical reporting infrastructure that steps can be taken towards the successful execution of an effective capitation policy as outlined in this paper.

This recommendation applies equally to the NHSO, the SSO (and the CSMBS).

With respect to the SSO, the following additional recommendations are made which should be taken into account in the short run:

➤ The share of the risk-adjustment in the total capitation payment needs to be increased.

➤ For OP care, it is deemed necessary to compensate providers to a greater extent for utilization differentials. An age-related capitation rate (similar to the NHSO/UC) may be an option, although it is unlikely that the large variation of utilization rates observed across providers can be explained by age alone.

➤ For IP care, it is recommended that providers be reimbursed based on DRG adjusted relative weights only (the flat-rate component should be abolished).

➤ The capitation share allocated for chronic disease patients should be increased to account for their relative cost. Consideration should also be given to include chronic disease patients in the (recommended) DRG-based payment arrangement for general IP care.

➤ The number of fee-for-service items (high cost and other fee-for-service items) should be reduced. Some of the current fee-for-service items could be absorbed into the (recommended) DRG-based provider payment system without increasing the financial risk to providers.