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Thailand

Health Care Reform: Financial Management

Report 6

A Common Health Care Financing Model (I) for CSMBS, IHPP, NHSO & SSO, and

Proposal for a Financial Management Structure

Terms of reference, review, supervision

September 2009

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List of abbreviations

BoB	Bureau of Budget
CPI	Consumer Price Index
CSMBS	Civil Servants' Medical Benefit Scheme
EU	European Union
FCF	Financial Coordination Framework
FCG	Financial Coordination Group
HCRP	EU/Thailand 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 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 Health
MPI	Medical Price Index
NHA	National Health Accounts
NHSO	National Health Security Office
NSO	National Statistical Office
PIU	Project Implementation Unit of the EU/Thai HCRP
PPI	Producer Price Index
SEC/SOC	Social Security Department of the ILO
SSO	Social Security Office
SSS	Social Security Scheme
UC	Universal Health Care Scheme
WCS	Workmen's Compensation Scheme

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Project Synopsis

Introduction

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 the EU followed the bold initiative taken by Thailand towards achieving full population coverage in health care: in 2001, 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** to be executed by the Social Security Department of the International Labour Office, Geneva (THA/05/01/EEC). Technical assistance activities under the project have been on-going since spring 2006 and will continue until end 2009.

Specific activities were scheduled under the ILO component, to be documented in a series of technical reports. The present report concerns the proposed financial management structure that was core to the project and the ILO task of drafting **terms of reference for a "national software development firm that will develop the software for the INFIMO", the review of that proposal, as well as the supervision of the software development and installation.**[1] As such, it covers **activities (k), (l), and (r)** of the project document and respective **outputs (e), (f) and (j)**.

The discussion surrounding the originally proposed Integrated Financial Monitoring System and the more consensual "coordination framework" ultimately agreed upon has already been documented.[2] It was also agreed, in close consultation with the Thai counterparts and main stakeholders that, instead of outsourcing the software development as originally intended, this activity would be better undertaken by units and persons within the health purchasing institutions concerned. The obvious reason was that the necessary expertise was readily available within these institutions but it was further acknowledged that institutional *ownership* of the results would also be better ensured.

The complicated nature of the "INFIMO" component meant that the drafting of the TORs for the development of the software necessarily evolved as the project progressed; on the basis of the close collaboration and constant interaction between ILO-SEC/SOC, its consulting actuary, the PIU and the institutions involved: CSMBS, IHPP, NHSO, SSO and others (e.g. NESDB, Ministry of Commerce), the execution of the TORs was in effect to be continuously reviewed and the development of the software continuously supervised.

Specifically, software development was not only dependent on the concrete model design which itself evolved over time[3] but also on future cooperation among the institutions

[1] For a better understanding of the issues involved and usage of the abbreviation "INFIMO" see: ILO/Thailand Report 3: *A Financial Coordination Framework – A first general outline*, under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC).

[2] ibid.

[3] See: ILO/Thailand Report 7B: *A Health Care Financing Model (II) for the Universal Coverage Scheme, the Social Security Scheme, the Civil Servants' Medical Benefits Scheme, including a Projection Module for Thailand's National Health Accounts. Documentation of work and progress*, under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC).

concerned (CSMBS, IHPP, NHSO, SSO). Collaboration between these four institutions was thus a prerequisite but was given new direction at various points during implementation of the project; as a result, and where possible, implementation of this activity was refocused on several occasions.

Against this background, it was considered appropriate to include in this report a chapter setting out a formal proposal for future collaboration between the four institutions.

The report is structured as follows:

(1) The proposal for a financial management structure, and related software development; a clarification of the issues and notions involved, and the consensus reached.

(2) A detailed outline of the data and proposed structure for the establishment of a common data base.

(3) The *Terms of Reference* for software development including (i) the overall *umbrella terms of reference* relating globally to «model design», the data and information base, and documenting the respective activities to be carried out, and (ii) *specific terms of reference* for the ILO consulting actuary technically responsible for the software development mapping the two consecutive phases of activity.

(4) Review of the software development/model design and notes on its supervision. At the time this report was finalized, software development was also complete, thus allowing for a thorough review of this activity.[4]

(5) A proposal concerning future collaboration between the four institutions involved (the "Financial Cooperation Group" or "FCG"; a proposed structure of collaboration is considered necessary in order to maintain the developed software (the model and its information base).

[4] Earlier drafts of this report (e.g. February 2008) had commented on earlier stages of software development.

1. A proposed financial management structure, or "INFIMO"[5]

It is recalled that one of the objectives of the project was to improve tools for the financial management of the national health sector, specifically through the development of a blueprint of an integrated national financial management and monitoring, reporting and accounting system.

In the initial months of project implementation, however, understanding of the notion "INFIMO" as originally imagined in the project document had changed considerably; a more consensual "coordination framework" was agreed upon by the parties concerned - as has already been documented.[6] It follows that this conceptual change impacted on other project activities, notably the development of software for the INFIMO.

Clarification was therefore necessary with respect to the project activity concerning the development of software for the INFIMO, and a consensus was found in early summer 2007 on a common interpretation of activity (k) [and output (e)] of the project document.

The agreement reached between project partners and stakeholders at NHSO Bangkok in May 2007 is summarized below.[7] It furthermore specifies the tasks of the Thai institutions involved (CSMBS, IHPP, NHSO, SSO, others) on which successful software development depended.

1.1. "INFIMO" software development: Background

According to the project document outlining ILO's responsibilities and obligations, ILO was assigned to carry out tasks and activities as follows:

(k) **TORs Software**: terms of reference for a national software development firm that will develop the software for the INFIMO;

(l) **Review Software Proposal**: a review of the proposal(s) of the national software development firm(s);

(r) **Supervision Software**: supervision of software development and installation; and

(x) **Software/system handover**: Thai counterparts effectively take over system operation;

Very little detail was given in the original project document concerning the formulation and implementation of these activities, particularly with respect to the terms of reference for software development. Moreover, at the time the project document was drafted, i.e. around 1½ years before the project actually commenced, it had been envisaged that this activity (k) would be carried out by a Thai software development firm.

[5] ILO/Thailand Report 3, op. cit.

[6] ibid.

[7] Edited version of minutes taken on that occasion; for further details see: ILO/SEC/SOC Mission Report W. Scholz, Bangkok, 3 June 2007.

1.2. "INFIMO" software development: Clarification

With a clearer understanding of the notion "INFIMO" established in the meantime,[8] the suggestion was put forward by the PIU that the software development be undertaken in fact not by a private Thai firm but by the direct beneficiaries of the software themselves, i.e. by NHSO, SSO, CSMBS, IHPP.

The move was welcomed by ILO as it helped to involve the four institutions in data management at an early stage, significantly improving their capacity to maintain a common modeling routine after effective takeover of system operations (activity (x)).

In May 2007, meetings were held in Bangkok between Mr Scholz and a number of counterparts in the four institutions who served as technical counterparts during project execution [of activities (k), (l), (r) and (x)]. In the end, it was these same persons who constituted the core group of technical experts who would handle the routine modeling process after project completion.

It was understood that, in their role of substituting for the private software development firm initially foreseen, NHSO, SSO, CSMBS and IHPP needed guidance with respect to the activities to be undertaken in connection with activity (k), both because of the unspecific formulation of tasks in the original project document but also in order to clearly specify the input required by ILO to ensure that those activities would actually be carried out.

1.3. "INFIMO" software development: Consensus

Agreement was thus reached between the Project Implementation Unit (PIU) and ILO on the specific contents of each of the activities (k), (l), (r) and (x), as follows:

*Drafting the Terms of Reference under activity (k) [« **TOR-(k)** »] is part of ILO obligations under the financial management component of the HCR project; the TOR-(k) are to be adjusted to the fact that software development will now be jointly undertaken by NHSO, SSO, CSMBS and IHPP.*

*The **TOR-(k)** must comprise (specify) the following elements:*

1) *Establishment of a COMMON DATA BASE: details of the data base will be a result of the (four) models as to be developed by ILO; the data base will be in standard (MS-Office) format; the TORs will NOT include any detailed description for the technical development of, e.g., a network solution (or similar) for the common consistent handling of the data base (or access to the data base) among the four participating institutions (CSMBS, SSO, NHSO, IHPP); the TORs might, in general terms, recommend a network solution;*

2) *Development of a DATA DICTIONARY: description of data (contents; methodology; periodicity; etc);*

3) *Proposal (blueprint) of a ROUTINE for a revolving PROJECTION PROCESS (organizational details, etc).*

***TOR-(k)** will be used by NHSO, CSMBS, SSO and IHPP for action; i.e. NHSO, CSMBS, SSO, and IHPP will outsource or pursue activities by themselves, based on discrete decision by either institution.*

[8] ILO/Thailand Report 3, op. cit.

4) *In concrete terms,* establishment of the common data base *is being understood as follows: NHSO, CSMBS, SSO and IHPP provide / continue using the software MS-Office environment for the common data base, which will be filled and updated in cooperation with ILO in the course of, or – where not otherwise possible - as a result of, the development of the (four) institutional health finance projection models, and their invariant model components; thus, the data base will be in standard (MS-Office) format, which guarantees that the model-components (to be developed by ILO) have easy access to the data base;*

5) *It is expected that, during the course of model development (to be undertaken by ILO), the data sets required for the completion of the common data base becomes increasingly specific; accordingly, in parallel, NHSO, CSMBS, SSO and IHPP will jointly start, in line with gradual data base progress, drafting* a data dictionary *containing the methodological and statistical description of all data contained in the common data base; the TOR-(k) provide guidelines as to the required standards of the data dictionary; the ILO supervises the drafting of the data dictionary;*

6) *During model development (responsibility of ILO) the possible shape of an annual* routine projection process *(budget, capitation, etc) common to NHSO, CSMBS, SSO and IHPP will become clearer; NHSO, CSMBS, SSO and IHPP will start in due time drafting such a (blueprint) routine process, which will be supervised and reviewed, were necessary, by ILO; the draft blueprint can later be used as a frame of reference for cooperation between the four institutions.*

It was understood and agreed that the ILO would supervise, review and revise, where necessary, the outcomes of all activities of NHSO, CSMBS, SSO and IHPP under items 4) to 6) in a cooperative way, as such fulfilling items (l) and (r) of the project document; ILO maintains documentation (reports, minutes, notes) with respect to those activities.

It was furthermore understood and agreed that ILO activity (x) "Software/system handover" would consist of:

- *a* closing seminar *(or similar event) focusing on the technicalities and organizational issues of the financial health modeling component of the project, and*

- *a* formal confirmation *through the PIU (after the seminar and after consulting with NHSO, CSMBS, SSO and IHPP) that all activities under items (k), (l) and (r) of the project document have been fulfilled by the ILO to the satisfaction of the PIU.*

In this context, therefore, and with the understanding and agreement of all concerned, Terms of Reference *[« **TOR-(k)** »]* were developed with respect to [*modified*] activity (k):

" **TORs Software**: terms of reference for ['~~*a national software development firm*~~'] *'NHSO, CSMBS, SSO, IHPP'* that will develop the software for the INFIMO".

In short, the overarching purpose of these TORs is to serve as guidelines for the data base development and related activities of NHSO, SSO, CSMBS and IHPP which are to become an integrated component of "INFIMO".

2. Terms of Reference for "INFIMO"

With respect to the successful execution of the overall financial management component of the Health Care Reform project, Terms of Reference for activity (k) ***«TOR-(k)»*** were formulated as follows:

2.1. Establishment of a COMMON DATA BASE through NHSO, CSMBS, SSO and IHPP

The establishment of the data base relates to the following logic of the health finance model(s) of the four institutions:

A. Population data

The population data refer to:

- The total population of Thailand;
- The scheme (covered) population of the NHSO;
- The scheme (covered) population of the SSO;
- The scheme (covered) population of the CSMBS.

Under the project, all data should be provided, as a minimum, for one common base year (2006); however, for analytical purposes, it is advisable to establish this data base for an historical period of (10) years; and to update it on a routine basis (see below).

All data must be provided by single ages (between 0 and 100) and sex (male, female).

As these required data come from different sources, are based on different counting methodologies, and might be exposed to different sources of systematic or non-systematic data errors, one main problem of the data base is to establish – and maintain over time – consistency among the data.

The data must be provided in a transparent common format in MS-Office environment.

An electronic (administrative) routine among participating institutions should be developed with respect to the transfer of data from the original institutional sources (computers) to the common data base (of the participating health institutions) under MS-Office.

Special attention must be given to organizing a timely routine of data maintenance (updates; methodological overhaul; etc.).

Responsibility for data maintenance and updates must be clearly stipulated.

B. Labour market supply data

The collection of labour market supply data refers to:

- Annual / annualized labour market participation rates that are being used by the Statistical Office / the NESDB to calculate overall supply of labour to the labour market in Thailand; or, alternatively, to

- Annual / annualized total labour supply.

Both sets of data must be provided by single ages (0 to 100) and by sex (male, female).

As labour market participation rates / total labour supply might only be available by age groups (i.e. not by single ages) numerical procedures of mathematical transformation allowing to convert grouped data into single-age data must be applied such that the sum of the transformed (single age) data is identical to the sum of (initial) age-grouped data.

Labour market participation rates must be made consistent with the total population data provided under *A. Population data*. In order to achieve consistency a decision must be made with respect to whether:

a) labour market participation rates are the result of dividing total labour supply (by single ages) by the total population (by single ages) or whether:

b) labour supply is the result of multiplying population (by single ages) by the participation rates (by single ages).

The decision to be taken will have an impact on (later) modeling; it is recommended to explore in detail, and pursue, option a). Option b) would require including in *A. Population Data* the total population as defined under the labour force survey.

The labour supply data base must be provided for the same base year (2006) and the historical period as the data under *A. Population Data*.

The data stored under *B. Labour market supply data* must be consistent with the labour market balance. (See below: *C. Economic data.*)

One major problem of the data base is to establish – and maintain over time – consistency of the methodology used for updating and calibrating the labour supply data (see above) and maintain this consistency with the population data as collected under *A. Population Data*.

The data must be provided in common format in MS-Office environment.

As far as considered appropriate, an electronic (administrative) routine among participating institutions should be developed with respect to the transfer of labour force data from the Statistical Office / NESDB (their computers) to the common data base (of the participating health institutions) under MS-Office.

Special attention should be given to organizing a timely routine of data maintenance (updates; methodological overhaul; etc.).

Responsibility for data maintenance and updates must be clearly stipulated.

C. Economic data

The collection of economic data refers to:

- National accounts data, current and – where applicable – real, especially of
    - GDP (demand side, supply side);
    - total sum of wages in the Thai economy;

- value-added of the *health sector* (within GDP), disaggregated by labour costs and non-labour costs;
- deflators (demand side, supply side) of GDP;
- capital stock data, and
  - specifically: capital stock of the health sector (hospitals etc);

- Price data
  - CPI;
  - medical CPI;
  - electricity costs;
  - hospital fee schedules;
  - pharmaceutical prices;
  - others;
- Insured wages, separately under SSO and CSMBS;
- Labour demand data, i.e.
  - number of self-employed;
  - number of dependent employed;
    - differentiation of the above under specific labour market contexts of Thailand;
  - number of insured in the participating schemes (SSO, CSMBS);
    - Differentiation of the insured populations by type (e.g. voluntary insured, mandatory insured, if and where appropriate).
- Special focus of the data collected under *C. Economic data* is the labour market balance.
- Labour demand data must be calibrated with respect to single age (15 to 69) and sex (male, female), at least for the base year (2006), and if possible for a sequence of historical data.

The economic data base must be provided for the same base year (2006); the historical period covered should date back to (1980).

SNA data should also be made available on a quarterly basis over the period since 1997/1998 (post-financial crisis). This might be important information for the routine short-term annual budget forecasts.

Price data must be made available, where applicable, on a monthly basis (e.g. CPI, electricity costs data), over a period starting 1997/1998 (post-financial crisis).

The data stored under the demand (and supply) side of the labour market balance must be consistent with the data stored under *B. Labour market supply data*: formally, this consistency is achieved by double checking for the correct calculation of the unemployment rate.

The data must be provided in a common format in MS-Office environment.

As appropriate, an electronic (administrative) routine among participating institutions should be developed with respect to the transfer of the conglomerate of economic data from the Statistical Office / NESDB / other institutions (their computers) to the common data base (of the participating health institutions) under MS-Office.

Special attention must be given to organizing a timely routine of data maintenance (updates; methodological overhaul; etc.).

Responsibility for data maintenance and updates must be clearly stipulated.

D. Scheme-specific data of NHSO, SSO and CSMBS

From the outset –and notwithstanding further data requests during the modeling period – the following data sets of the institutions NHSO, SSO and CSMBS must be provided:

- Insured population,
  - by sex and age;
  - by type of hospital, i.e.;
    - university (teaching) hospital;
    - provincial hospital;
    - district hospital;
    - other public hospitals;
    - private hospitals (where applicable);
- frequency of contacts (total volume of contacts) to the health sector of the insured population;
  - by the same identical breakdown as for the above insured population;
- costs of those contacts with the health sector of the insured population (total volume of costs according to hospital « shadow fee » data);
  - by the same identical breakdown as for the above insured population.

Blueprints that might be used as guidelines for the requested data format are provided (.xls files as attached to original TORs) as follows:

- CSMBS: Draft TOR for model development – phase Jul to Sep 2007 – CSMBS Health Data BLUEPRINT.xls
- NHSO: Draft TOR for model development – phase Jul to Sep 2007 – NHSO Health Data BLUEPRINT.xls

- SSO: Draft TOR for model development – phase Jul to Sep 2007 – SSO Health Data BLUEPRINT.xls

Further data specifications might be required during the active modeling phase (to be executed by ILO), implying that the data base may have to develop further into a more detailed structure. Proposals will be made accordingly during the modeling process.

As appropriate, an electronic (administrative) routine among participating institutions should be developed with respect to the transfer of a conglomerate of economic data from the Statistical Office / NESDB / other institutions (their computers) to the common data base (of the participating health institutions) under MS-Office.

Special attention must be given to organizing a timely routine of data maintenance (updates; methodological overhaul; etc.).

Responsibility for data maintenance and updates must be clearly stipulated.

E. IHPP Data

The International Health Policy Programme (IHPP) should provide the National Health Accounts of Thailand (NHA-Thailand; OECD methodology) on electronic media, ideally in English, over the same time period (past number of years) and in the same format as published.

When and where required, and where possible, IHPP should provide additional information (data) on the estimation procedure and the actual composition of published data.

As appropriate, an electronic (administrative) routine among participating institutions should be developed with respect to the transfer of a conglomerate of economic data from the Statistical Office / NESDB / other institutions (their computers) to the common data base (of the participating health institutions) under MS-Office.

Special attention must be given to organizing a timely routine of data maintenance (updates; methodological overhaul; etc.).

Responsibility for data maintenance and updates must be clearly stipulated.

2.2. Drafting a Data Dictionary (dictionary to serve as reference for the Common Data Base)

For all data included in the above data base NHSO, SSO, CSMBS and IHPP will jointly develop a Data Dictionary that contains a systematic methodological and statistical description of all data contained in the data base.

A possible format for the description of the data is provided (.xls file as attached to original TORs):

- Draft TOR for model development – phase Jul to Sep 2007 – Data Dictionary BLUEPRINT.xls

2.3. Proposal (blueprint) of a routine for a revolving projection process

A routine needs to be established for making reasonable use of the periodicity of data publication, an adequate process of updating the data base, adjusting the models of the participating institutions to new data information, and new projections.

This sequence of activities is called the *Revolving Projection Process*.

The participating institutions NHSO, SSO, CSMBS and IHPP will jointly develop a manual that describes the routine, throughout each year, of the *Revolving Projection Process*.

A rational sequencing of this routine very much depends on:

a) the periodicity of data publications, and

b) the requirements for budget projections (capitation and other) of the government / the participating institutions.

Accordingly, the Routine will be jointly drafted by NHSO, SSO, CSMBS and IHPP in due time in line with the progress of data collection, data dictionary and modeling. In this respect ILO advises that reference be made to ILO/Thailand Report 3[9]:

It is expected that NHSO, SSO, CSMBS and IHPP each appoint one or two persons:

- to develop the three above tasks to be delivered under these ***TOR-(k)***, and
- to cooperate actively with the ILO and / or the (ILO) modeller.

[9] ILO/Thailand Report 3; op. cit.

3. Software development: Umbrella terms of reference

The Terms of Reference set out above ***[TORs-k]*** aimed at clarifying and distinguishing the different activities and responsibilities of ILO-SEC/SOC on the one hand and the Thai institutions involved on the other, and reflected the consensus and understanding between ILO and the PIU concerning the proposed management structure.

Once this agreement had been reached, umbrella terms of reference were drawn up by ILO to address its own tasks and responsibilities under this project activity, and to serve as guidelines for a contractor. A consultant professionally familiar with data base design, data analysis and modeling of social security systems (in this case, social health) was sought and subsequently recruited (referred to as "ILO Actuary").

The following TORs address the activities to be undertaken by ILO-SEC/SOC and its consulting actuary.

Development of a health care financing model, and staff capacity building, for
The Civil Servants Medical Benefit Scheme (CSMBS),
The Social Security Scheme (SSS),
The Universal Health Care Scheme (UC), and
The International Health Policy Programme (IHPP) of Thailand

Terms of Reference

1. Background

Collective and advance financing mechanisms for health care in Thailand have been developed step by step over decades. In addition to health care provided to civil servants and their families, and to private-sector workers through taxation and social insurance, "universal health care coverage" for all Thai citizens has been introduced since 2002 through the implementation of the tax-financed Universal Health Care Scheme (UC).

The government plays the major role in social financing health care in Thailand.

Most government employees and pensioners, including their dependants, are covered by the Civil Servants Medical Benefit Scheme (CSMBS), while relatively few depend on their respective institutions' specific health benefit schemes with a similar benefit package to the one offered under the CSMBS. These schemes are non-contributory and entirely financed through taxation.

Private sector employees, including the non-statutory employees of the public sector, are covered under the Social Security Scheme (SSS); their dependants are covered by the UC, not the SSS. Employees, employers and the government contribute to the SSS; the scheme is administered by the Social Security Organization (SSO), supervised by the Ministry of Labour (MOL).

The remainder of Thai citizen are covered by the Universal Health Care Scheme (UC). The government finances the system out of general taxation; the scheme is administered by the National Health Security Office (NHSO), supervised by the Ministry of Public Health (MOPH).

Although, compared to more developed countries, national health care expenditure is still kept at a low level the expenditure is, nevertheless, fast increasing. In the face of steady demographic aging it becomes more and more important to prepare for measures that contribute to keeping the system financially sustainable in the long run. It is also important that different benefit packages, different contracted providers and different provider payment mechanisms are being gradually aligned, to the extent possible, in order to provide health care in response to the needs of people.

In order to achieve desirable policy outcomes it is important that constructive discussions should be held, and information exchanged, among the three schemes (above) providing finance for the delivery of health services, based on a common framework of understanding and information.

In this respect the development of scheme-specific health care financing models, and of a separate health model governed by the International Health Accounts methodology (OECD - IHPP), is essential. These models, while covering (projecting) different aspects of the Thai health financing fabric, would be based on a common data-base and commonly agreed assumptions and methodologies and, thus, contribute significantly to facilitating those discussions.

On the above background, four health care finance models will be developed that can be based on coordinated assumptions on demography, economy, labour market, and health care utilization and unit cost developments.

The models will project revenue and expenditure of Thailand's health system(s), be based on annual data and have a short (budgeting) to long-term projection horizon.

Specificities of the three single schemes will be sufficiently mapped; the model for the IHPP will have a common data base with the other three models.

Core technical staff from the three schemes and the International Health Policy Programme (IHPP) in charge of the maintenance of the model(s), will support the model development and be trained in the usage and future calibration of the models.

2. Further details of the terms of reference

Under the supervision of the Senior Economist of the ILO Social Security Department and the Social Security Specialist of the ILO SRO-Bangkok,

the ILO Actuary will undertake the following tasks:

(1) Review the data and actuarial studies of the health systems under CSMBS, NHSO and SSO;

(2) Review those data in the IHPP, which will be used for medium-term and long-term projections of Thailand's national health system;

(3) With a view to most appropriate model design (simulation options; see point (4)): consult with CSMBS, NHSO, SSO and IHPP staff on possible reform plans of the CSMBS, NHSO and SSS. These might include different payment methods (e.g. fee-for-service versus capitation or case-mix payments (in case of the CSMBS)), different ways of capitation calculation (e.g. with or without inclusion of capital depreciation), or the possible coverage of dependents and future pensioners (SSO);

(4) Decide on modelling options that most appropriately incorporate any of those reform details;

(5) In consultation with CSMBS, NHSO, SSO and IHPP staff: specify the data, and their format, to be collected;

(6) Establish the common demographic, labour market and economic frame for the four models;

(7) Establish the health care financing modules for three schemes CSMBS, NHSO, and SSO as well as the model for the IHPP;

(8) Carry out status-quo projections, and reform simulations in coordination and cooperation with the staff of CSMBS, NHSO, and SSO – in order to validate the significance of the outputs of the established models;

(9) Consult with the staff of the CSMBS, NHSO, SSO and the IHPP on the projection and simulation results, and modify the models' structures to the extent that they produce unreasonable results;

(10) Present the models, their functioning and selected simulation results in a seminar,

(11) Describe, for each institution (CSMBS, NHSO, SSO and IHPP) separately,

(a) the model structure,

(b) the handling of the model;

(12) Develop training material;

(13) Carry out a one-week common training workshop for the staff of the CSMBS, NHSO, SSO and the IHPP (15 – 20 staff) on the usage of the models;

(14) Hand out the electronic version of the models to the staff of the CSMBS, NHSO, SSO and the IHPP;

(15) Provide the above (items (1) to (14)), and all other stipulations contained in this document to the satisfaction of the ILO. The reports should include major data sources, a clear description of the models' designs (methodology), the assumptions, examples of results, technical findings and recommendations for future model maintenance.

3. Schedule

May 2007	Initial meeting of ILO Expert with technical staff of the CSMBS, IHPP, NHSO and SSO for a first tentative clarification of details
May - June 2007	Specification of models' designs; data specification by ILO Expert
June - July 2007	Data collection by CSMBS, IHPP, NHSO and SSO technical staff
August - October 2007	Modelling, including data analysis, calculation of base scenarios (4 models), simulations; interim (tabulated) draft reports by ILO Expert
November 2007	Review of the tabulated draft reports and of the models by CSMBS, IHPP, NHSO, SSO, and ILO (Senior Economist and Social Security Specialist);
November – January 2007	Finalization of the models (based on the reviews); drafting the full reports and documents as described under the details of the TORs;
February 2008	Training workshop with CSMBS, IHPP, NHSO and SSO staff, hand out of the models to the staff;
February – March 2008	Finalization, editing and printing of the report and final hand out of the model, the model specification documents, the reports and the training manuals to the ILO.

4. Budget

Not relevant in this report.

5. Preconditions and caveats

It is assumed that necessary data for the model should be developed in collaboration with CSMBS, IHPP, NHSO and SSO staffs and in close consultation between the Actuary, CSMBS, IHPP, NHSO and SSO staff.

In case delays are caused in the data collection process, there could be delays in delivery of the intermediate and final result.

The budget is expert fees (including fees for his participation in seminars / training workshops, lecturing fees). Other cost such as printing cost of the reports, the cost for the seminar / training workshop (e.g. cost for the venue, equipments and refreshments) are not included in this budget.

As project implementation proceeded, it became clear that these TORs were very ambitious and that more time would be required than initially envisaged to carry them out. There were also unavoidable delays in data delivery by the four institutions involved compounded by data inconsistencies which could not easily be resolved (see comments below) although at no time did these delays put at risk the timely delivery of project outputs.

3.1. Specific terms of reference, initial phase [TOR-IP] (July to September 2007)

The umbrella TORs as outlined above were further detailed in order to provide concrete guidance for the contracting ILO Actuary. These specific Terms of Reference for the initial phase ***[TOR-IP]*** drafted in May 2007 are reproduced below:

Development of a health care financing model, and staff capacity building, for
The Civil Servants Medical Benefit Scheme (CSMBS),
The Social Security Scheme (SSS),
The Universal Health Care Scheme (UC), and
The International Health Policy Programme (IHPP) of Thailand

Terms of Reference

Terms of Reference for the initial phase (July to September 2007)

[WORK FLOW CHART ATTACHED]

[File CSMBS HEALTH DATA BLUEPRINT.XLS ATTACHED]

These ***Terms of Reference for the Initial Phase*** (***TOR-IP***) specify the activities to be undertaken during the initial phase of the overall modelling process.

They are based on, specify and partially replace, the Draft Terms of Reference (Draft03 dated 02/05/2007 – [note: « Draft 03 » is identical with Section 3 "Umbrella Terms of Reference" above]). The overall contents of Draft03 remain valid and should be understood as reference for the detailing of further TOR that will follow after the activities of this TOR-OP have been finished. The contractor to these TOR-IP is advised to refer to the Draft03 for further information.

The contents of Draft03, as far as not replaced by these TOR-IP, remain valid; the time frame defined in Draft03 is however no longer fully applicable. For the initial phase of modelling, these TOR-IP replace the time frame of Draft03 (see attached flow chart of activities).

1. Activities to be carried out

Under the supervision of the Senior Economist of the ILO Social Security Department and the Social Security Specialist of the ILO SRO-Bangkok,

the contractor to these TOR-IP will undertake the following tasks:

(1) Draft-design of model structures; specify and check data; (July and August 2007)

The health finance projection and simulation models to be developed for NHSO, SSO, CSMBS and IHPP will be described, in writing, in their core structures.

This includes:

Description of

- the legislation (as far as relevant for modelling) of the covered population;
- the statistical representation of the covered populations (numerical data base);
- the approach of moving the covered populations from t to t+1 (demographic modelling approach);
- the revenue and expenditure (fiscal accounts, budgets);
- the costs per health benefits / health services *offered* by health providers, including the rules governing their development ("shadow-fee basis");
- the costs per benefits / services *covered* (*reimbursed*) by health purchasers, including the rules governing reimbursements ("reimbursement basis");

for each of the three schemes UC, SSO, and CSMBS, separately (where adequate).

For UC, SSO and CSMBS health expenditure, the modelling approach will be based on similar modelling approaches as follows:

Exp = Pop * g * f * c,

Where

Exp = Health expenditure of scheme [UC, SSO, CSMBS respectively]

Pop = covered population of scheme [UC, SSO, CSMBS respectively]

g = factor representing the ratio between number of patients of scheme and insured of scheme [UC, SSO, CSMBS respectively]

f = factor representing frequency of contact of patients with scheme [UC, SSO, CSMBS respectively]

c = costs per patients' contact with health system [UC, SSO, CSMBS respectively]

In the case of SSO and UC information on c will be derived from hospitals' reports on charges ("shadow fees"). Support will be provided by SSO and NHSO staff in order to collect and interpret the data.

All variables / parameters will be calculated by *single ages* (0, 1, …, 100), by sex, by *in-patients* and *out-patients*, and by *hospital type*, i.e. public (non-teaching, public teaching, others) and private – to be determined with Thai counterparts.

Special attention will be given to the establishment of a ***consistent data base***:

The data base will refer to 2006. If incomplete, data of 2005 will be used to adjust and complete the 2006 statistical data.

It must be made sure that, in 2006, the data base [for UC, SSO, CSMBS respectively] is consistent in the sense that the above equation, i.e.

Exp = Pop * g * f * c,

is being fulfilled for all three schemes, i.e. multiplying and adding up over (single-age) vectors **Exp, Pop, g, f** and **c** provides total expenditure as measured statistically (in the fiscal accounts) in the three schemes [UC, SSO, CSMBS] respectively. (= calibration of data base)

The data base, year 2006, will form the basis for model design and model projections over time (moving data-vectors from T to T+1). It is the basis to be updated later, once the model is (the models are) finished and handed over to the Thai counterparts.

In SSO and UC, there are health expenditure items that are not, in the data base, covered by the in-patient and out-patient systematic, but "kept separately". Some of these expenses are available by single patients, i.e. can be structured by single ages vectors, by sex, by type of hospital etc. With respect to some items, other information structured information is available. The contractor will make adequate use of that information in collaboration with the Thai counterparts for structuring the data base 2006.

When shaping the model design and the data base(s) for UC and SSO it has to be kept in mind that important model outputs in both cases (schemes) are the *capitation rates* for either scheme. The capitation rate calculation should be based on transparent methods such that these can be used, after hand-over of the models to the institutions, for calculating the annual budget proposals to the respective committees.

It is expected that the contractor pays special attention to an adequate modelling approach for the population covered by the CSMBS. This special attention is required as there is demographic modelling experience of the ILO with respect to the SSO and the UC, but not with respect to the CSMBS, where the greater part of the covered population is a function of the development of the number and structure of active civil servants.

Problematique of modelling the CSMBS covered population

The CSMBS covers:

1) Civil servants (most civil servants from 18 (minimum age) to 60 (retirement age; few exemptions);
2) Their parents;
3) Their spouse (if Muslim: their spouses);
4) Maximum of three (3) children per civil servant (idem: couple) until they turn 20 years of age;
5) Permanent employees (incl. their dependents, like for civil servants) from 16 (minimum age) to 60 (retirement age; no exemptions; all receive lump sum at retirement, no pension)

as long as the civil servant maintains his / her status as a civil servant.

By the end of their career, at retirement, *some* opt out – against one time payment of a (high) lump sum – and loose their own CSMBS health coverage and, also, CSMBS health coverage for their dependents.

Permanent employees all loose their status at retirement, i.e. they and their dependents loose CSMBS coverage at retirement of the active.

Unless receiving other health coverage both groups (former actives and their dependents) then refer to UC.

At present, total CSMBS membership is about 5 million persons, of which 1.9 million are active civil servants, 20 thousand permanent employees, and the rest – around 3.1 million persons – dependents.

This totals to a total number of 16 different groups; the information exists by single ages between 0 and 100.

HOWEVER, the CSMBS does not have information about expenditure differentiated by those groups. Accordingly, such information does not (yet) exist about allocation of total CSMBS expenditure on in-patients and out-patients.

Only spending information available is TOTAL EXPENDITURE.

Follows preliminary modelling approach for CSMBS-members:

MEMBERS = CSm + CSf + CSSPm + CSSPf + CSCHm + CSCHf + CSPARm + CSPARf +
+ EMPm + EMPf + EMPSPm + EMPSPf + EMPCHm + EMPCHf +
+ EMPPARm + EMPPARf

with:

Civil servants

1)	CSm	=	Civil servants, male
2)	CSf	=	Civil servants, female
3)	CSSPm	=	Spouses, male, of civil servants
4)	CSSPf	=	Spouses, female, of civil servants
5)	CSCHm	=	Children, male, of civil servants
6)	CSCHf	=	Children, female, of civil servants
7)	CSPARm	=	Parents, male, of civil servants
8)	CSPARf	=	Parents, female, of civil servants

Permanent employees

9)	EMPm	=	Permanent employees, male
10)	EMPf	=	Permanent employees, female
11)	EMPSPm	=	Spouses, male, of permanent employees
12)	EMPSPf	=	Spouses, female, of permanent employees
13)	EMPCHm	=	Children, male, of permanent employees
14)	EMPCHf	=	Children, female, of permanent employees
15)	EMPPARm	=	Parents, male, of permanent employees
16)	EMPPARf	=	Parents, female, of permanent employees

Modelling problem is mainly to find an algorithm that treats the dependents as a function of the actives. Total actives will have to come from the labour market balance.

See also file CSMBS HEALTH DATA BLUEPRINT.XLS, attached.

Costs

A further problem is that TOTAL EXPENDITURE has to be allocated, in the base year, on single ages of the above groups AND on in-patients and on out-patients.

In other words, the contractor will need to establish a hybrid database such that, for the base year, the sum of all sum products equals TOTAL EXPENDITURE. It is only then, that the standard demography-related projection method can be applied.

The CSMBS maintains two detailed lists of prices to be paid for:

(1) medical goods and appliances, and

(2) services.

These lists may be used as indicators for solving the above problem.

These lists are agreed upon between CSMBS and health providers; prices are maximum amounts reimbursed. If hospitals charge higher prices the civil servant has to pay the difference out of pocket. The lists only apply to public hospitals. In other words, thus far, if a civil servant [or dependant] goes to a private hospital s/he has to pay the whole bill out of pocket.

Also, CSMBS will apply CSMBS-specific DRGs (in-patient classification system) as of June 2007 to Civil Servant cases of treatment of inpatients.

However, for the time being, different RWs are being multiplied with different base amounts, e.g. in

- $Hospital_1$ = $RW_{base\ rate}$ * 10000 Baht, in
- $Hospital_n$ = $RW_{base\ rate}$ * 15000; etc.

It is planned later to group hospitals by categories (e.g. university hospitals, others) and force them within groups to apply identical, group specific, base rates.

The contractor is expected to explore whether the estimation of an *average base rate multiplier* is possible and, if so, a "reasonable" parameter to be used in CSMBS expenditure modelling.

Specification of data implies: defining the complete list of data required for modelling the above schemes.

It was agreed between ILO, CSMBS, and PIU (Thaworn) that data of CSMBS will be provided by CSMBS (Mr Kulasake Limpiyakorn, Financial Analyst: The Comptroller General Department, Min of Finance; sek139@yahoo.com, mobile: (666) 555-3139). Data format is specified in the attached file CSMBS HEALTH DATA BLUEPRINT.XLS.

The discussions between the Thai counterparts and the ILO project manager, undertaken in 2006 and spring 2007, have shown that it might be advisable to disaggregate all base year data by different types of hospitals in all three schemes, i.e. in UC, SSO and CSMBS at least by public-teaching, public-non-teaching (sub-district, district, provincial), private, and possible other categories.

It is expected that the contractor establish the data base (the data bases for the different schemes) in collaboration with the Thai counterparts such that differentiation of the above kind is taken into account.

In many respects, the contractor can refer to prior work undertaken by the ILO – especially for the demographic labour market and macro-economic parts, in other respects new data terrain will have to be covered.

NHSO, CSMBS, SSO and IHPP will collect and provide the specified data.

These data have to undergo the usual actuarial checks, which will be undertaken by the contractor to this contract in cooperation with NHSO, CSMBS, SSO and IHPP.

(2) Data check and first draft table of contents of data dictionary; (July and August 2007)

The activity under (1) above will be supported by data collection activity through NHSO, CSMBS, SSO and IHPP.

These data have to undergo the usual actuarial checks, which will be undertaken by the contractor to this contract in cooperation with NHSO, CSMBS, SSO and IHPP.

Data specification and actuarial data check will be used for drafting a first table of contents of a data dictionary – to be completed extra this TOR-IP -, containing a statistical description of contents and definitions etc of the data needed for model maintenance.

(3) Common demographic, labour market and economic frame for the four models; (August to September 2007)

A demographic, labour market and economic frame of models has to be developed that can be used by CSMBS, NHSO, SSO and IHPP as common input to their respective institutional health models (to be developed later in detail).

The variables that have to be produced by the above frame-models depend, in detail, on the final design of the institution-specific health models; in other words: the frame-models will be of a preliminary character, and later be adjusted, fine-tuned, and finalized.

The contractor, in undertaking his/her work can relate to prior modelling work of the ILO for NHSO and SSO. The new design element is to make sure that the structure of the frame-models is designed such that the structure equally satisfies the needs of model-input of all four institutions' institutional health models.

It will have to be tested whether it is possible (under modelling perspective) to design the demographic frame model such that it calculates the

UC-covered population as a residual of

- total population development,
- SSO-population development,
- CSMBS-population development, and
- "private" population development,

i.e.:

- $Pop_{UC} = Pop - Pop_{SSO} - Pop_{CS} - Pop_{Priv}$

One problem (under this approach) would be to design the model such that "stable", "reasonable" development of Pop_{UC} is guaranteed over the practice of model application, given the fact that Pop_{Priv} is not explicitly known and a number of statistical inconsistencies between Pop_{UC} and Pop exist and have to be solved.

Labour supply will have to be designed according to the input needs of the four models for the four institutions.

The labour market balance of the economic sub-module will have to be designed consistently with labour supply. It will have to be explored to what extent labour supply calculations (by sex and single ages) can be used as input to the demand side of the labour market balance and to which extent, vice versa, labour market demand can function congruently as input for the supply side.

Accordingly, the economic sub-module will have to produce output on costing elements, i.e.

- Price indexes, and
- Average wages
- Productivity,
- Employment of various type,

for each of the four institutions' models.

Consistency between SNA and NHA is to be maintained.

(4) Design and data base; specify demographic model for CSMBS; (August to September 2007)

The contractor is expected to develop, as a result of his / her work during TOR-IP, a decisive view on how the institutional modelling for the revenue and expenditure for NHSO, SSO, CSMBS, IHPP can best be developed. In other words, the initial draft design must be turned into a concrete proposal for modelling, explaining the structure and, especially, the problems that need to be solved.

The concrete proposal for modelling NHSO, SSO, CSMBS, IHPP must be delivered in writing, attachments can be delivered in electronic format (i.e.: Excel and / or Visual Basic program examples).

Further, it is expected that the contractor will have developed, by the end of his / her work, a practical proposal with respect to modelling the population covered under the CSMBS, taking into account the explanations under *(1) Draft-design model structures; specify and check data; (July and August 2007)*, Section: ***Problematique of modelling the CSMBS covered population*** (see above). In developing the proposal the contractor will pay special attention to modelling entries and exits into the CSMBS system; this includes exploring possibilities of applying civil service (CSMBS) specific assumptions on fertility and mortality. The modelling proposal (model) is expected in electronic format; it must be described separately in writing.

In summing up, the TOR-IP basically stipulate the following:

- Clarification and fine-tuning of modelling designs;
- Depending on the model designs: establishment of the data base, including data calibration, for m2006 (2005); the data base must be complete;

Specific care must be taken with respect to the making consistent of *calendar year data* with *fiscal year data*;

Where data are not available, but necessary for reasonable modelling (example: cost data CSMBS), the contractor provides consistent estimates (to the extent possible: theory based or otherwise “reasonably” constructed, based on established estimation procedures or methods of numerical / actuarial mathematics, or on other methods of rational reasoning);

- Development of (finalize) modules for the outer framework for the institutional models, i.e. demography, labour supply, labour demand, economy;
- Develop a concrete demographic model, related to the labour market balance of the macro-economic model, for the covered population of CSMBS (incl. computer application);

All work steps and results will be conceptually tested for their robustness and practicability in a framework of modelling cooperation between NHSO, SSO, CSMBS, and IHPP to be established and implemented latest as of mid-2008. This comprises questions of routines, during a year, of updating the data base(s), especially.

3. Schedule

The work is expected to be accomplished over the three months July to September 2007.

A *work flow chart* stipulating which work should reasonably be done when is attached.

4. Budget (Expert fees)

Not relevant in this report.

5. Preconditions and caveats

It is assumed that necessary data for the model should be developed in collaboration with CSMBS, IHPP, NHSO and SSO staff and in close consultations between the contractor, CSMBS, IHPP, NHSO and SSO staff.

In case delays are caused in the data collection process, there could be the delay in delivery of the intermediate and final result.

The budget is expert fees (including fees for his participation in seminars / training workshops, lecturing fees, if any, including travel required under the TOR-IP). Other cost such as printing cost of the reports, the cost for seminars / training workshops (e.g. cost for the venue, equipments and refreshments) are not included in this budget, and will be covered separately.

6. Attachments

The two files a) WORK FLOW CHART, and

b) CSMBS HEALTH DATA BLUEPRINT.XLS

are part of these TOR-IP.

3.2. Specific terms of reference, second phase [TOR-SP] (February to June 2008)

Upon completion of the first phase, follow-up TORs were drawn up to cover a second phase ***[«TOR-SP»]*** of the work required to finalize the software development (model design) activities:

Development of a health care financing model, and staff capacity building, for the Civil Servants Medical Benefit Scheme (CSMBS), the Social Security Scheme (SSS), the Universal Health Care Scheme (UC), and the International Health Policy Programme (IHPP) of Thailand.

Terms of Reference

It is understood that, at the commencement of the execution of these ***TOR-SP*** the obligations and works under the initial phase [*TOR-IP*] were fulfilled such that the tasks to be carried out under these TORs could be fulfilled.

The contents of Draft03, as far as not replaced by these TOR-SP, remained valid; the time frame defined in Draft03 was however no longer fully applicable. Therefore, for the second phase of modelling, these TOR-SP replace the time frame of Draft03 (see the attached updated flow chart of activities under TOR-SP).

Under the supervision of the Senior Economist of the ILO Social Security Department and the Social Security Specialist of the ILO SRO-Bangkok, the contractor to these TOR-SP undertakes the following tasks:

On the background as provided in Draft 03 (see above), s/he develops four (4) health care finance models, which, each, are characterized by the fact that they can be based on a common, coordinated set of assumptions on demography, economy, labour market, health care utilization and unit cost developments.

The models will be designed such that they project expenditure and revenue of Thailand's health system(s); the models are annual, i.e. they are based on annual data and will produce annual (annualised) outputs; their time horizons will range from short (for budgeting purposes) to long-term.

Institutional, legal and behavioural specificities of the three single schemes will be sufficiently mapped; the scope of the data base of the model for the IHPP goes beyond the scope of the data bases of the three schemes but, where possible, the IHPP model will make use of the data bases of the three schemes.

Core technical staff from the three schemes and the International Health Policy Programme (IHPP) in charge of the maintenance of the model(s), will support the model development and be trained (see below) in the usage and future calibration of the models.

Especially the contractor will:

(1) Establish a common demographic, labour market and economic frame for the four models to be developed for CSMBS, NHSO, SSO and IHPP;

(2) Establish the health care financing modules for three schemes CSMBS, NHSO, and SSO as well as the model for the IHPP (NHA);

(2a) Develop modules for allocating the available overall resources (budgets) to the hospitals that have contracted with NHSO and SSO. The contractor will explore the feasibility of the development of such a module for CSMBS, and make proposal(s), accordingly. Technically, the allocation mechanism will be "top-down" for both, NHSO and SSO, and it will, to the extent possible, replicate, as a standard procedure, the present mechanisms applied by NHSO. The allocation mechanism for SSO will be newly developed; where appropriate, the SSO allocation mechanism will draw advantage from the allocation mechanism developed for NHSO;

(3) With a view to most appropriate model design (possible simulation options; see also point (5) below): consult with CSMBS, NHSO, SSO and IHPP staff on possible reform plans of the CSMBS, NHSO and SSS. These might include different allocation formulas, different ways of capitation calculation (for example, with or without inclusion of capital depreciation), or the possible coverage of dependents and future pensioners (SSO);

(4) Decide on modeling options that most appropriately incorporate any of those mentioned details;

(5) Carry out status-quo projections, and reform simulations in coordination and cooperation with the staff of CSMBS, NHSO, and SSO – in order to validate the significance of the outputs of the established models; consult with the staff of the CSMBS, NHSO, SSO and the IHPP on the projection and simulation results, and modify the models' structures to the extent that they produce unreasonable results;

(6) Describe, for each institution (CSMBS, NHSO, SSO and IHPP) separately,

(a) the procedures of model maintenance,

(b) the handling of the model;

(7) Develop training material;

(8) Carry out a three days common introductory training workshop (proseminar) for the staff of the CSMBS, NHSO, SSO and the IHPP on the purpose and use of the models;

(9) Carry out separately, for the staff of each of the institutions CSMBS, NHSO, SSO and the IHPP, hands-on training at staff work places, on the technical use of their respective models;

(10) Hand out the electronic version, and any accompanying training material, of the models to the staff of the CSMBS, NHSO, SSO and the IHPP, as well as to ILO-SEC/SOC;

(11) Provide the above (items (1) to (10)), and all other stipulations contained in this document to the satisfaction of the ILO.

As part of the technical modeling work, in addition to the electronic model to be developed and in order to reflect and document work progress, the contractor writes the following reports on the above items (draft titles – open to adjustments in consensus with ILO-SEC/SOC):

(A) A common demographic, labour market and economic frame and health care financing modules for CSMBS, NHSO, SSO and IHPP. (This report covers item (1), above.)

(B) Financial projection models for CSMBS, NHSO, SSO and IHPP – core design and technical incorporation of allocation formulae and reform options. (This report covers items (2), (2a), (3) and (4), above.)

(C) Status-quo projections, and reform simulations, for the financial development of CSMBS, NHSO, SSO and under NHA (IHPP). (This report covers item (5), above.)

(D) Model maintenance and practical handling of the models of CSMBS, NHSO, SSO and IHPP. A manual. (This report covers items (6) and – partially - (7), above.)

(E) Introduction to the practical use of the models for CSMBS, NHSO, SSO and IHPP. Seminar training material. (This report covers items (7) – partially –, and the didactical material needed for items (8) and (9), above.)

(F) Note on the formal hand-over of the models and any accompanying material to the staff of CSMBS, NHSO, SSO and IHPP. Formal notes on the delivery of the training activities. (This note covers items (8), (9) and (10), above.)

The work is expected to be accomplished over a six-months period, starting with the signature of the contract to which these TOR-SP refer.

A work flow chart stipulating which work should reasonably be done when is attached.

It is assumed that necessary data for the model(s) have been collected in close collaboration with CSMBS, IHPP, NHSO and SSO staff and in close consultations between the contractor, CSMBS, IHPP, NHSO and SSO staff. This work has provided all involved with an a priori understanding of the actual modeling (model design) to be undertaken.

In case of delays in the data collection process (see TOR-IP), which might “stretch” the process of data collection and of constructing the data base into this second phase (TOR-SP) of the project, there could be a delay in delivery of the results as expected under these TOR-SP.

Budget

Not relevant in this report.

Thailand: Health Care Modelling, Phase 2 - Suggested workplan (jch)

	Activity	Jan 08	Feb 08	March 08	April 08	May 08	June 08
1.	Develop a common demographic, labour market, and economic frame for the 4 models						
2.	Develop the health care financing and resource allocation modules for UC, CSMBS, and SSS and a projection model for IHPP (status quo)						
3.	Consult with UC, CSMBS, and SSS on possible reforms on allocation of funds and formulate alternative scenarios accordingly						
4.	Adjust model design to incorporate allocation scenarios in the most appropriate manner						
5.	Carry out projections for status quo conditions and alternative scenarios and consult with the four schemes on model results and modify scenarios accordingly						
6.	Develop manual on models including procedures for model handling and maintenance						
7.	Develop training materials						
8.	Carry out an introductory workshop on model structure, common features, and handling						
9.	Undertake in-house training with the technical staff of each scheme on model handling and maintenance						
10.	Hand over final models to UC, CSMBS, SSO, IHPP, and document delivery for ILO						

4. Review of software development process and notes on supervision

The software development process was executed by ILO's consulting actuary, Mr Jean-Claude Hennicot in close cooperation with the institutions indicated in ***TOR-(k)*** (section 2 above), i.e. with CSMBS, IHPP, NHSO and SSO.

At its core, software development was to be oriented according to:

(a) data needs, and

(b) the proposed model design (structure) as defined in ***TOR-(k)*** and in ***TOR-IP***.

Both data and model are described in detail in a separate report. [10]

Data had to be supplied through various institutions, notably NESDB, MoI, MoC, NSO, CSMBS, IHPP, NHSO and SSO. After the usual checks for correctness and consistency, data were stored in MS-Office environment (Excel).

The health model (in a more narrow sense, i.e. the mathematical relations required to move initial data from t to t+1, and to distribute (disaggregate) certain aggregate (volume) data in t) was also formulated in MS-Office environment (Excel, including Visual Basic applications).

During all activities required to evolve the data base and the model structure the ILO consulting actuary cooperated closely with and was thoroughly supported by the above-mentioned institutions which broadly complied with their tasks as set out in ***TOR-(k)***.

Progress in this work was documented in a number of reports through 2007 and 2008 by the ILO consulting actuary, compiled separately in ILO/Thailand Report 7B. An overview of the work and progress, and the respective reports is set out below.

4.1. Main Reports 2007

Report 1: Development of a Health Care Financing Model-Initial Phase, October 2007

In line with ***TOR-IP***, this report covers four main issues:

- Description of the core design features of the three schemes CSMBS, NHSO, and SSO;
- Overall and scheme-specific demography;
- Expenditure modeling;
- Calibration of CSMBS base year expenditure structure according to needs governed by modeling design.

[10] ILO/Thailand Report 7A: *A Health Care Financing Model (II) for the Universal Coverage Scheme, Social Security Scheme, Civil Servants' Medical Benefits Scheme, including Projection Module for Thailand's National Health Accounts. User Manual*, under ILO/EU: Financial Management of the Thai Health Care System (THA/05/01/EEC).

Furthermore, the report discusses data problems, some miscellaneous issues and next steps to be undertaken. It contains two annexes documenting demographic and expenditure data of SSO, and the following excel files with demographic and expenditure data, partially calibrated as required, and with blueprints for future data storage under MS-Excel (data base):

- CSMBS_basic_model_calib: basic model data CSMBS calibrated;
- CSMBS_demographic_FY06: Demography CSMBS, cleaned, fiscal year 2006;
- Data_framework_CSMBS: Data base blueprint CSMBS;
- Data_framework_SSO: Data base blueprint SSO;
- Data_framework_UC: Data base blueprint NHSO;
- Population_data_MOI: Thai population (registry Ministry of the Interior);
- SSO_basic_data: Basic demographic data SSO (IP, OP);
- UC_demographic _FY06: Basic demographic data NHSO (IP, OP).

Each file consists of several sheets, as appropriate.

The report together with annexes demonstrated that progress in the assignment and the quality of work undertaken met the requirements of the TOR-IP.

Report 2: Development of a Health Care Financing Model-Initial Phase, November 2007

In line with ***TOR-IP***, this report covers three main issues:

- the common demographic, labour market and economic frame proposed for the models to be developed for UC, SSS, and CSMBS;
- a detailed specification of the demographic model for the CSMBS;
- a truncated draft table of contents for a data dictionary (to be completed later).

The report also includes a section on the IHPP model to be developed. It notes that some of the data presented are not final (e.g. population data). Work progress was substantially supported through the on-going cooperation extended by the national counterparts, in particular their efforts undertaken with respect to assembling data, re-iterative improvement of data quality and providing insights to the data operations and other aspects of their respective schemes.

The following Excel files were attached to the report:

- Pop MOI: *Population data for 2006 and 2007, MOI database*
- Pop: Results *of the preliminary population projection (ILOpop)*
- Control: Control *file (ILO population model)*
- Mort estimation: *Estimation of mortality rates*
- Mort: *Input data on* mortality *and LEB* (ILOpop)

- Fert: *Input* data *on fertility rates* (ILOpop)
- Mig: Input data *on migration rates* (ILOpop)
- Labour force MOI: *Labour force data and projection*
- ECON: Economic data and module
- NHA 02 – 05: National Health Accounts, 2002 - 2005
- CSMBS pop data Nov 07: CSMBS-covered population, CGD database

Each file consists of several sheets, as appropriate.

Report 3: Development of a Health Care Financing Model-Initial Phase, December 2007

This is the final report under ***TOR-IP***, concluding the initial phase of software (« model design ») development. In substance the report is a consolidated synthesis and further qualification of the findings (data collected; model design) and proposals presented (data bank; model design improvements) in the two earlier reports (see above). The template for the data dictionary awaits completion.

Work progress during the initial phase (2007) was partially impaired by a tendency to «move the goal posts» during project execution; i.e. during the data collection and model design process the ongoing collaboration and cooperation with Thai counterparts led to various suggestions involving modifications in the modeling approach and, thus, in the types and structure of data to be collected.

However, overall work progress made with respect to model design development during this initial phase ***[TOR-IP]*** has been very satisfying. A solid basis has been reached to progress further during the second phase of the modeling process, which commenced in February 2008.

4.2. Main Reports 2008

Report 4: Development of a Health Care Financing Model-Second Phase, June 2008

In line with the TORs of the second phase, this report covers three main issues:

- the development of modules for the allocation of scheme budgets earmarked for medical care to contracted providers, this is for the UC, SSO and – at that stage of project development – possibly for the CSMBS;
- the consultations with the three schemes regarding reform options under consideration with a view to incorporate reform scenarios in the assumptions used for model calculations;
- the completion of the design of the single budgeting and allocation modules.

In particular, the report contains in its Annexes B and C complete formal (mathematical) descriptions of the resource allocation mechanisms currently applied by SSO and NHSO.

Progress and the quality of work as documented in the report and its annexes, were perfectly in line with the timetable and expectations set out in the TORs.

Throughout the whole "INFIMO development" process – including the drafting of this report, cooperation between all players – the CSMBS, IHPP, NHSO, SSO, other Thai institutions, ILO's consulting actuary and ILO-SEC/SOC, was excellent – cooperative and mutually supportive in all respects, and remained so throughout.

Report 5: Development of a Health Care Financing Model-Second Phase, November 2008

In line with the TORs of the second phase, this report documents short- to medium-term model projections for all three schemes (CSMBS, SSS, UC); projections relate to the full set of modules, i.e.

- Population;
- Labour market;
- Economy;
- CSMBS: coverage and financial development;
- SSS: coverage and financial development;
- UC: coverage and financial development.

Modeling results include status-quo projections and tentative reform scenarios. The report also includes status-quo projections for the National Health Accounts.

The report as well as annexes demonstrated once more that both progress and quality of work were perfectly in accord with the terms of reference as stipulated.

Throughout the "INFIMO-development" process, as well as the drafting of this report, cooperation between all participants – CSMBS, IHPP, NHSO, SSO, other Thai institutions, ILO's consulting actuary and ILO-SEC/SOC – was totally collaborative and mutually supportive at all times, remaining so throughout.

Report 6: Development of a Health Care Financing Model-Second Phase, September 2008

and

Report 7: Development of a Health Care Financing Model-Second Phase, August 2008

These two reports are core to the overall project as Report 6 contains, in its Annex B, a comprehensive user manual for the health care financial (budget and allocation) model for the three purchasing institutions CSMBS, NHSO and SSO, and Report 7 reports on, and contains the material used for the training of Thai officials in the use of the model.

Reports and annexes demonstrated yet again that in both content and substance as well as timing the work accomplished was completely in line with the terms of reference.

It should once again be stressed that during the whole "INFIMO development" process – including the drafting of this report, cooperation between all actors – the CSMBS, IHPP, NHSO, SSO, other Thai institutions, ILO's consulting actuary and ILO-SEC/SOC, was excellent – of a cooperative and mutually supportive nature in all respects – and remained so throughout.

5. The Financial Cooperation Group (FCG) – maintaining the information base and making the budget and the resource allocation models work

In ILO/Thailand Report 3, the structure, tasks and operations of a standing working group putting the model in motion and making it part of routine governmental practice, has been described in some detail. The group was called *Financial Cooperation Group, or FCG*. As the establishment and continued operation of this group is essential for making productive use of the model for health finance policies and financial and structural cooperation among the involved institutions (mainly CSMBS, IHPP, NHSO, SSO), the present chapter reiterates, with a few modifications concerning *resource allocation*, core elements from that report.

At the time this report was finalized (December 2008) the future institutional setting of the working group had become more tangible. It is expected that the group be given the formal shape of an *Institute* under the MoPH. A formally established institute would most probably be in a much better position (than a voluntary working group) to execute its tasks as described below; such a formal institutionalization would be strongly supported by ILO-SEC/SOC.

The standing working group (FCG) – or Institute, once established – might be charged with the following tasks:

— ***Collect*** systematically and continuously the following information (thus setting up a data bank):

- Statistics on:
  - National Accounts, i.e., GDP (nom, real), GDP by sectors (special focus on health sector according to SNA), primary distribution of GDP, wages (national, sectoral, especially in health sector), etc.;
  - Population and labour markets, i.e., full breakdown of labour supply and demand; breakdown of labour demand, especially by sectors, focus on employment in health, etc.;
  - Scheme populations: i.e., members and beneficiaries of CSMBS, SSO, NHSO/UC;
  - Prices, especially on prices/costs in the health sector, pharmaceutical prices, etc.;
  - Financial flows (revenue, expenditure) of the health system by the three schemes; "physical" variables determining health finances as, for example: number of health staff (doctors, nurses, others), number of hospitals, beds, inpatient "contacts", number of drugs sold/prescribed etc.;
  - International developments in health care (for international comparison), for example: mortality rates, deaths by type (according to WHO systematic), prices of drugs, etc.;
  - Statistics collected are to be stored in a *Statistical Archive* (hardcopies, electronically) and should be made accessible, in Thai and in English, on the Internet.

- Develop and maintain knowledge/expertise on ***methodology*** of:
  - Population statistics and National Accounts, especially methodological treatment of health in the SNA;
  - Treatment of health within the system of health accounts (WHO-systematic);
  - Indicators relevant to the *allocation of resources* to providers under NHSO and SSO;
  - Indicators relevant to the *allocation of resources* to providers under CSMBS (explorative studies and reform proposals);
  - Information is systematically to be stored in the *Statistical Archive*.
- Maintain ***legislation*** on health:
  - National;
  - International (selection);
  - All information to be systematically stored in the *Statistical Archive*.
- Aim at and maintain active membership of working groups:
  - In order to maintain the knowledge base, (members of) the FCG should participate in international (regional) and national working groups that deal with health financing and resource allocation issues; through participation in these working groups the FCG maintains its stakes in the national and international debate/discussion/ developments of health financing policies.
  - All information is to be stored in the *Statistical Archive*.

— ***Analyze*** the information collected for purposes of budgeting / resource allocation / policy information. Analysis of the collected information comprises:

- ***Processing*** of statistical information collected with the help of standard statistical techniques (programmes);
- Making proposal for ***allocating resources*** to providers;
- Tabular and graphical ***presentation*** of information;
- Factor analysis/***explanation*** of statistical results;
- ***Interpretation*** of statistical results;
- Monitoring and assessment of ***adequacy of legislation*** on basis of statistical results;
- Monitoring and assessment of international and national statistical and ***methodological*** developments in the area of health;
- Monitoring and assessment of internationally implemented developments in ***health policies*** (as far as applicable to the Thai case; to be specified);

- Model versions and results are systematically stored in the Statistical Archive.

— ***Process the*** information collected and analyzed for purposes of budgeting/policy formulation.

- Development and maintenance ***of health (budget and resource allocation) models*** for CSMBS, SSO, and NHSO/UC:
  - the models aim at short-, medium-, and long-term ***projections*** and simulations, mainly on an annualized data basis;
  - they will distinguish between acute care and the new issue on Thailand's social policy agenda: long-term care. It is obvious that no data are yet available that could form a basis for modelling long-term care. In other words, this part of the model(s) to be developed will be of a "generic" character applicable for costing purposes;
  - models must be mainly demand-side driven (how many cases?), but also have a strong supply-side "leg" (capacity orientation: is the required number of carers available?);
  - models allow for projecting and monitoring, on an annual basis, the financial statements of the providers (hospitals) related to CSMBS, SSO, and NHSO/UC at *individual provider level*; [11]
  - permanent ***updating*** of the models with the statistical information collected;
  - updating the models' structures according to ***changes in legislation***;
  - updating of the structure of models according to ***changes in availability of statistical data***;
  - tabular and graphical ***presentation*** of model results;
  - ***explanation*** of model results;
  - ***interpretation*** of model results;
  - monitoring and assessment of national and international ***modeling methodology*** in health;
  - monitoring and assessment of internationally ***proposed developments*** in ***health policies*** (as far as applicable to the Thai case; to be specified);
  - model results etc. are to be stored in the Statistical Archive.
- ***Membership*** in modeling and policy working groups:
  - in order to ***maintain*** its ***knowledge base*** the FCG participates in national and international working groups that deal with modeling health; through

[11] It is anticipated that during the project FCG members together with ILO develop methods acceptable to all three institutions.

participation in these working groups the G***overnment of Thailand maintains its stakes and influence*** in the national and international debate/discussion/developments of health modeling and its possible repercussions on statistics, methodologies and policy;

- with respect to policy formulation at national and international level, the FCG ***contributes*** the ***model results*** (projections, simulations) and their explanation and interpretation ***to national and international working groups*** dealing with health policy formulation.

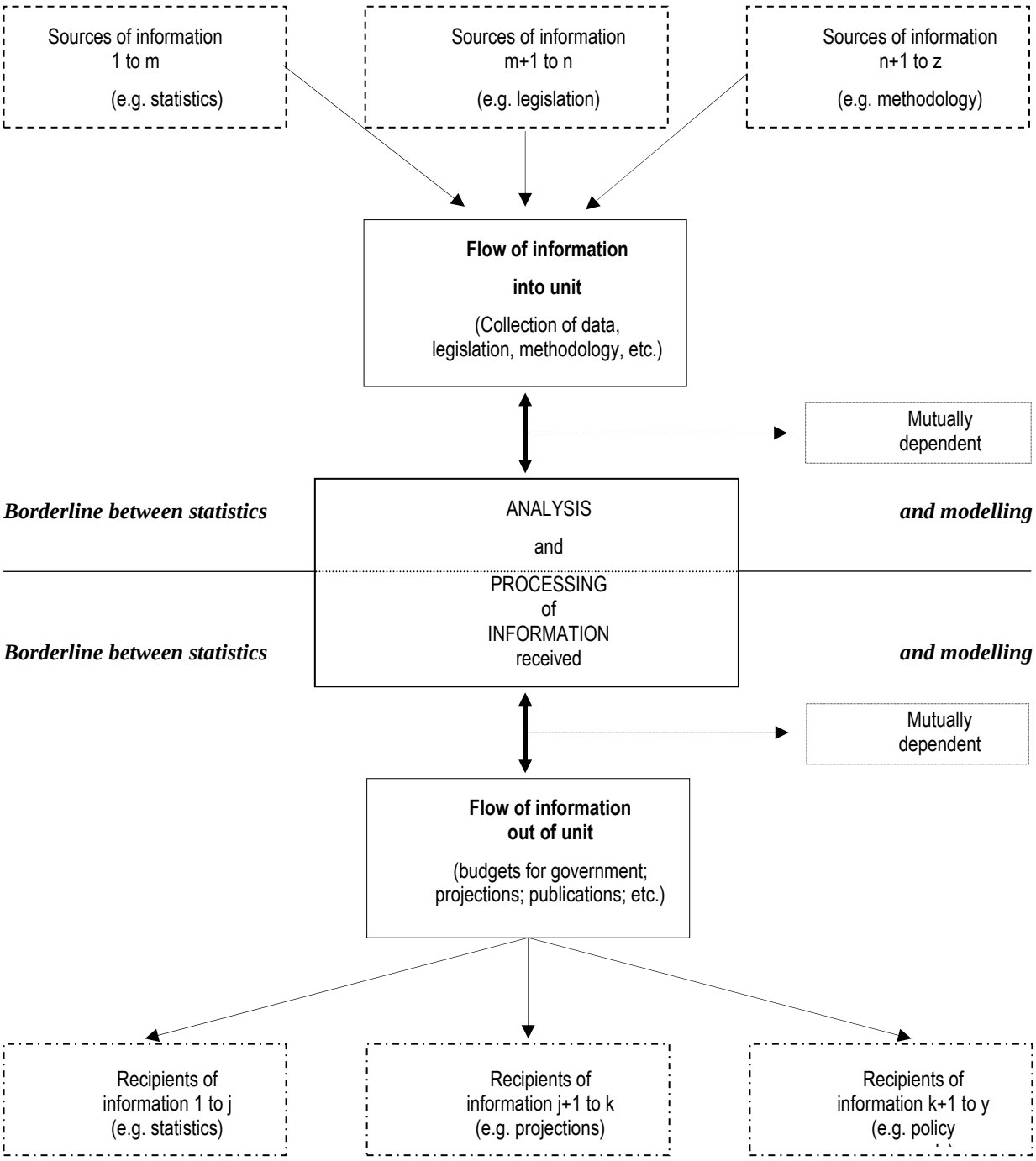
— ***Disseminate*** the information collected, analyzed and processed for purposes of policy information:

- Regular systematic statistical information to the government/to others;
- Regular ***systematic production of short-, medium- and long-term forecasts/ projections*** of "the health system", predominantly its finances for budgeting purposes; addressees: government/others;
- Regular ***systematic provision of proposals for resource allocation*** to NHSO and SSO;
- The FCG ***participates in government operational working groups on short- and medium-term policy planning*** (budget; public investments; general (social policy development plans; etc.) – participation may impact on the annual working routine of the FCG, and on those other working groups;
- Regular (annual) ***publication*** of statistical information on the three schemes, CSMBS, SSO, NHSO/UC (in Thai and in English);
- Making available ***to other*** interested ***institutions*** in ***electronic format*** the ***statistical information*** collected (i.e., to research institutes; universities; international organizations (WHO, OECD, ILO, others);

In order to perform its duties the FCG has to develop an annual (possibly multi-annual) work routine. Details will be developed later.

A formal structure of the FCG – or Institute, once established – is provided in the following chart.

Structure of FCG



Notes (related to chart):

1 Inflow (collection) of information has to be organized among involved institutions, i.e., CSMBS, SSO, and NHSO/UC;

2 Analysis of information depends on information received, on analytical instruments available and on information requested by recipients;

3 Processing of information depend on information received, on analytical instruments available and on information requested by recipients;

4 Outflow (dissemination) of information (incl. periodical statistical publications) has to be organized.

5 The FCG would be advised to develop a matrix that shows the type of work to be done by the FCG over time, for example as indicated by the following blueprint (to be enlarged and filled):

Matrix of FCG activities during year

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Task 1	X	x	X		X	x		X	x			
Task 2			X		X						X	
Task 3		x		x						X	X	X
…	…	…		…				…	…	…		
Task n										X	X	X

Matrix of FCG activities over several years (optional)

Activity	Y 1	Y 2	Y 3	…	Y t
Task 1	z	z		…	z
Task 2			Z		z
Task 3		z		z	
…	…	…	…	…	…
Task n	z	z	Z	z	z

Staffing of the FCG – or Institute, once established – should consist of six professionals: two from each scheme (CSMBS, SSO, NHSO/UC) = official working group [or, in case an Institute were established: two persons should be responsible for each scheme's subject matters].

The group members work on an equal basis; it may be advisable to give presidency (on a *primus inter pares* basis) of the group to CSMBS, SSO, and NHSO/UC, revolving annually.

Furthermore, the group would require three information specialists or programmers; one-two additional support staff ("statistical clerks"); secretary. Total = 6 persons. These should be situated in a unit functioning as a support unit to the working group; terms of reference for each staff member would be specified in detail (two to three pages) only after the tasks and work flow of the unit have been specified in detail.

The costs for the support unit of the working group should be equally shared between CSMBS, SSO, and NHSO/UC or, in case of an Institute, be fully borne by the MoPH.

6. Conclusions

The terms of reference as documented in this report became the basis for model development, including the required data base. In December 2008, at the time this report was finalized, modeling works were complete and the model and all related information successfully handed over to the Thai counterparts.

To this end, it can be noted that ILO's terms of reference under the overall project have been successfully fulfilled.

At end 2008 it is not fully clear how the Thai government will finally make use of the model, and where – administratively – it might be implemented and maintained. The earlier idea of having a permanent FCG, as described above, established is again being questioned. The core idea of that group was equal membership in the group of CSMBS, IHPP, NHSO and SSO, with presidency possibly revolving among member institutions at regular time intervals. It now seems that the Bureau of Budget (BoB) may wish to take over responsibility. Given the fiscal problems arising from the foreseeable financial developments especially of the CSMBS, but also of the NHSO (UC) and, to a lesser extent, of the health expenses of SSO, BoB's interest is understandable but also reasonable.

A reasonable alternative would be to formally (administratively) establish an Institute, under the supervision of the MoPH, that would deal independently with establishing formal budget proposals, and resource allocation proposals, for the three public purchasing institutions (CSMBS, NHSO, SSO) under the supervision of the MoPH.

Further talks with the Government will be necessary in order to find a solution.