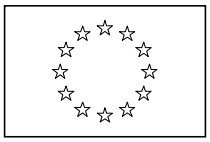

European Commission

Twinning Light Contract under a decentralised EU-Pre-Accession Programme SR 3002-004-995-03-06/0001

Slovak Republic

Strengthening of statistics health information system and its harmonisation with EU requirements

Final Report

(March 2005)

Member State Partner	Federal Ministry of Health and Social Security, Federal Republic of Germany GVG e.V. (Gesellschaft für Versicherungswissenschaft und –gestaltung e.V.), Cologne, Germany ; mandated body of the Federal Ministry of Health and Social Affairs, Germany (for the purposes of this report as implementing agency)

Project No.	SR 2003 004-995-03-06-Public Health

Identification

Twinning light Project N°:	SR 2003-004-995-03-06
Title of the Project:	Strengthening of statistics health information system and its harmonisation with EU requirements
Project Duration:	24 April 2004 – 31 March 2005
Reporting Period:	24 April 2004 – 31 March 2005
Submitted by:	The German Project Leader
Place, Date:	Cologne, _____
Signature:	_____
Endorsed by:	The Slovak Project Leader
Place, Date:	Bratislava, _____
Signature:	_____

Table of Contents

1. Project Synopsis

Project Title	Strengthening of statistics health information system and its harmonisation with EU requirements
Project number	SR 2003-004-995-03-06/0001
Country	Slovak Republic
Overall Objective	The overall objective of the project is to complete the implementation of the Acquis concerning monitoring of health statistics and creation of a system of health monitoring.
Specific Objective	The specific objective of the project is to ensure methodological and technical strengthening of capacities for statistical health information according to EU requirements/ EUROSTAT
Planned results	Health indicators methodology developed Requirements of analytical software determined Responsible employees of Ministry of Health SR (MoH) and Institute of Health Information and Statistics (IHIS) trained on the implementation of the new developed methodology Health information file in accordance to actual requirements of EU Acquis (EUROSTAT), OECD and WHO
Planned reports	Inception report Final report
Project activities:	Elaborate comparative analysis of health indicators; harmonise and redefine the required methodology and terms of health indicators with regard to the requirements of the international organisations Specify technical requirements for the hardware (HW) and software (SW) for the usage of the new developed methodology and develop terms of reference Organise training course on the (actual stage) implementation of the new methodology for staff of MoH and IHIS in the Slovak Republic (training is planned to be provided together with SW contractor expert to be procured under a different service contract. In case the SW will not be developed in time, the training will be theoretical and not alongside the practical use of the software) Support the development of a system of health accounts In the case of objective reasons, that will not allow the running of the pilot testing, the following another activity is proposed to be realised after approval of both sides: Assess the functionality of the new system according to a set of criteria
Project Partner	Ministry of Health of the Slovak Republic
Beneficiary institutions	Ministry of Health of the Slovak Republic Institute of Health Information and Statistics
Project Starting Date:	24.04.2004

Duration:	11 calendar months

2. Introduction

The health care reforms in the Slovak Republic led to a reform of the monitoring system of Public Health. Health indicators and their monitoring facilitate the analysis of the current health situation and serve as a basis for a tailored and targeted strategy for health policies. A health monitoring system that fulfils EU /EUROSTAT requirements and that is based on the experience in Western European Countries will guarantee a common systematic and integrated monitoring, which will support the environmental and security initiatives across the whole country. The establishment of a general mechanism for data sharing, availability, accessibility and comparability of information is the overall target of the Commission of the European Communities.

The main objective of this twinning light project was to enable the Slovak Republic to take the necessary steps in completing the implementation of the Acquis Communautaire in terms of creation of a system of public health monitoring and monitoring of health statistics. In order to reach this objective, the system of monitoring and data collection had to be harmonised with the EU standards and the requirements of international organisations such as EUROSTAT, OECD and WHO.

IHIS as provider of countrywide health statistics monitored throughout the last few years the status of the population with special focus on the health situation, the network of the health facilities and their activities, manpower and human resources in the health section, economic status of health services and state of real estates as well as equipment and facilities.

The general aim of the twinning light project was to support the IHIS in:

- elaborating comparative analysis of health indicators,
- completing the harmonisation of the required methodology of health indicators,
- defining the conditions, outputs, inputs and functionality of the special software for application and utilisation of new methodology,
- training of staff at MoH and IHIS on the implementation of the methodology
- pilot testing of the new system.

The project's aim was to provide assistance on the basis of international experience in the field of statistics in health information systems. Hence, the harmonisation of the methodology with EU standards was strengthened and supported. Furthermore the project gave assistance and imparted practical knowledge on and experience in public health monitoring.

3. Results of the Twinning light project

Activity 1: ***Development of new methodology and indicators for the collection, processing, evaluation and reporting on health data***

A working group will be established at the beneficiary institution including Member States (MS) expert, MoH SR and IHIS representatives. After receiving the input data from CC local experts (MoH SR, IHIS), MS expert will elaborate comparative analysis of health indicators. On the basis of this material, the MS expert with the assistance of the working group will complete the harmonisation of the required methodology of health indicators including the redefinition of terms, the new structure and range of monitored indicators, develop the assumptions for further unification of other health indicators, including the implementation of harmonised methods of data collection, processing, assessment and reporting using the developed technology.

Among other things health reporting is the information source for the health situation and health risks, the reporting of the development of diseases and the causes of death as well as the reporting of health care of the population or specific population groups. A goal for future health reporting should be an easy access to this information for ministries, decision makers, specialists but also for the citizens of the European countries.
Easily accessible and respectable health information for citizens is the basis for personal responsibility and active participation in therapy decisions and treatment processes. Health information covers information on the infrastructure of the health system as well as on health-related topics such as nutrition or physical activity or chronic diseases, e.g. heart diseases or diabetes mellitus.

The development of telematics in the health care system is an important component in order to simplify the entrance to qualified information on health and illness, i.e., information on health risks as well as on professional consultation and therapy. In addition the specific needs for information of specific population groups such as migrants can be considered.

Health indicators are measures to determine and describe phenomena of health and diseases in populations. These measures are one important basis of health reporting, on a local, regional or national level as well as for standardized international comparisons. The adequate preparing of health indicators for international comparisons as well as for national use and its easy access and update is one step in order to correspond to future requirements.

About 730 health indicators were prepared by IHIS for international organisations. About 190 indicators were regularly prepared for EUROSTAT, about 300 indicators for OECD and about 190 indicators for WHO. In addition about 140 indicators on health accounts are requested by OECD.

In the frame of this project the names, availability, periodicity and sources of all indicators were listed in Excel sheets by the Slovak experts. Three groups of health indicators were defined regarding comparability with international definitions and availability for given years.

- “Black indicators”: These indicators are available for all (or most) of the given years and comparable with the definitions of the international organisations.
- “Blue indicators”: These indicators are not comparable with the definitions of international organisations.
- “Red indicators”: These indicators are not available at IHIS.

All indicators (black, blue and red) were verified regarding definition and availability by short term expert 2 (STE) and the responsible experts at IHIS. The results of the verification and additional comments are listed below.

In a second step corresponding indicators requested by the international organisations were selected. Names of indicators, written descriptions as well as indicator values were compared. This approach was necessary as some indicators have the same name (description), but different values, other indicators have identical values, but different names (descriptions). One reason of identical values, but different names (e.g. "total number of hospital discharges" vs. "hospital discharges / 100 000") is that calculations "per 100 000 of population" are performed at the Office of OECD and not at IHIS. Due to the fact that the available information on health indicators was spread in different Excel sheets and that these sheets were limited regarding clarity it was decided to enter all available information on health indicators into an Access database. All Excel sheets were modified in a way that allows an import of data to an Access database (so called “small auxiliary database”) programmed by STE1. That means, English and Slovak names of the indicators were separated from one into two fields and thematic domains were defined for every indicator.

In the next step these data were imported into the Small Auxiliary Database (SAD, see below). Additional fields were defined and available data was entered to fulfil the requirements of the programmers, who will prepare the database (as described in the software tender). The purpose of the SAD is to serve as an instrument for the programmers as well as to serve as central meta data information system. That means, all important information on health indicators required by the experts of IHIS is available in the small auxiliary database. Additionally, meta data information of national indicators can be added to the database.

Results

- ***Comparability and availability of indicators***

Comparability and availability of indicators submitted to the international organisations were checked in close co-operation with the IHIS staff. For EUROSTAT indicators the “New Cronos Database” was chosen as basis, because health reporting of the Statistical Office of Slovakia (SO SR) is based on the definitions of this database. The alternative use of the “ECHI 2” list had been discussed, but was rejected due to the above stated reasons. Another reason to work with the New Cronos Database was that the character of ECHI 2 seems to be provisionally. Results and recommendations regarding indicators with deviating definitions or non-available indicators are given in Annex IV.

- ***Small Auxiliary Database***

SAD is an MS Access database application which holds meta information on health indicators. The intended scope of the SAD are the indicators which need to be transmitted to international organisations, predominantly to EUROSTAT, but also to OECD and WHO. The SAD is thus a structured registration of all relevant health indicator data, its definitions, availability, sources, periodicity and accessibility.

Further to that, the SAD holds meta information on all health indicators that are transmitted to the international organisations. Additionally the SAD holds information on indicators for health accounts, as requested by OECD. All indicators for health accounts in the SAD are defined as one-dimensional indicators and for a top-down-approach. The needed 3-dimensional definition of these economic indicators cannot be realized with the SAD. Instead another database will be necessary. The number of indicators in the SAD has been reduced. For example the two indicators “number of physicians, national level” and “number of physicians, regional level” were redefined as one indicator. For this *new* indicator a grouping criteria were defined (r – regional level). The SAD was presented to the experts of IHIS at a special training session. Content as well as technical questions were discussed.

For additional information see Activity 3 and the attached SAD-Manual.

Activity 2*: Specification and description of the technical requirements for the hardware and software needed for the computerized application of the new methodology, as well as for the formulation of the Terms of reference for the Technical Assistance to be contracted for its development*

An ad-hoc working group consisting of the MS expert and representatives of the MoH SR and IHIS will define the conditions, outputs, inputs, and functionality of the special software for application and utilization of new methodology. Technical Assistance will subsequently use software specification proposal to developed specified, required software.

Preparation of Terms of Reference for Equipment and Software Development:

Essential parts of the project were the preparation of an equipment specification and Terms of Reference (ToR) for SW for the information system required to improve the analytical capacity of the MoH and IHIS, as well as to speed-up and generally improve the health data reporting to international organisations, mainly EUROSTAT..

Specification of Equipment:
The equipment for the system must be capable to handle large amounts of data in high processing speed, and to keep identical copies between the two locations where the system shall be used. The technical basis is predominantly formed by a high-performance database system, which also determines further ancillary components, for instance a hard disk array and a reliable data backup system.
The equipment specification finally consisted of the following items:

- HW

Server – HW means for processing data and controlling other associated processes
Disk array – an expandable data storage for the collected data
Tape library – data protection by continuous backup/archive of collected and processed data
Rackbox, UPS and Air Condition

- SW

Database engine – SW which controls processing of collected data and generates relevant outputs
Backup engine – SW which controls backup and archive processes
Volume management software – SW responsible for management of data storage

- Network

Firewall – protects the network against attacks and intrusions from outside which could lead to data corruption or abuse
Switches – allow to build a high performance network with good scalability, management and security
UPS – protects the hardware against power failures and, thus, possible data losses
Structured wiring network, air-conditioner
Fibre Optic Cable

- Personal Computers

PC – personal computer incl. display unit and printer for the involved work places
Notebook – alternative solution to PC for mobile users
Printer – for high capacity print-out

- Data Projector

Data Video Projector – for professional mobile presentation

ToR for SW:

The tender dossier for the software for the analytical and reporting system were prepared in accordance to the PHARE rules, and by the templates as they are given by the EuropeAid procedures. The core element was the ToR for the SW development services to be provided.

Starting from an introduction into the current state of affairs in the sector, the ToR listed the objectives and expected results of the contract. The assumptions for contract implementation were given and the underlying risks were mentioned.

The main part of the ToR comprised an explanation of the scope of work and the specific activities to be undertaken. This was formulated as a framework, so that the tenderers would have a chance to demonstrate their level of understanding of the contract objectives and their capability to develop an appropriate implementation strategy.

Specific activities stipulated were:

- Project Mobilisation
- Elaboration of a detailed analysis
- Preparing a detailed system specification
- Development of the system design
- System Implementation
- Initial set-up and data entry
- Piloting
- Completion of development
- Testing
- Training and Manuals
- Documentation

For all these activities, distinct deliverables were specified in order to document the development process and to enable the beneficiaries (MoH, IHIS) to closely monitor the project progress. The deliverables are of a very technical nature and need to be assessed and discussed by a project manager assigned by the beneficiaries. In addition to them, reporting obligations were defined which allow the procurement agency to follow up the contract administratively.

Another essential part of the ToR was the stipulations for project personnel. Four key expert positions were defined:

- Team Leader (TL) with a technical background, experience in SW development and high skills in team organisation and communication;
- SW Architect, a computer scientist with practical experience in the development of multi-tier architectures and databases by use of modern development methodologies;
- Meta Database Expert with a sound knowledge of meta data modelling and relational database systems, and modern development methodologies

- Leading programmer with sound theoretical knowledge and practical experience in SW development, object-oriented programming and system integration

Further stipulations given by the ToR referred to the facilities to be provided by the consultant (support staff, office accommodation, equipment) and the time frame for implementation. The final chapter listed indicators for monitoring and evaluation and the means to verify the indicators.

Results:

- ***HW Tender submitted to the MoH in June 2004***

(see Annex 2)

- ***SW Tender submitted to the MoH in August 2004***

(see Annex 3)

Activity 3: ***Training of staff at MoH SR and IHIS on the implementation of the new methodology***

The EU member states expert will further provide 5 days training for Data centre operators/employees for the utilisation of the above-mentioned methodology for the collection of indicators.

In addition to the face to face instruction during several missions of STE 1 and STE 2 a Training Manual for the use of the SAD has been written and translated into Slovak (see Annex I):

Introduction

SAD is an MS Access database application which holds meta information on health indicators. The intended scope of the SAD are the indicators which need to be transmitted to international organisations, predominantly to EUROSTAT, but also to the OECD and the WHO.

The SAD is primarily aimed at the collection, consolidation and presentation of information on Slovak health indicators in a format and structure which can be directly used by programmers of SW for health data analysis. It is expected that these programmers will have experience in database implementation and health information systems, but not necessarily in health indicator meta databases in particular. Thus, it is essential that the analytical work on indicators is documented in a way which is also comprehensible for a usual database programmer and which has the goal to shorten the actual data analysis phase to be carried out by them. This will give them more time for developing SW of higher overall quality.

In addition to comprehensibility, it is important that the information on health indicators uses a clear terminology. It is absolutely important to avoid redundancy. For instance, a database programmer could be unsure whether the indicator *No. physicians (FTE)* and the indicator *No. physicians physical persons* are actually the same figure or not. However, as long as it is guaranteed that the indicator terminology is non-redundant ("unique"), a programming team can be sure that these

indicators are different ones and that they need an individual treatment by the SW.
It is also important to avoid identical naming for different indicators. Some names of disease-related indicators can be found twice, once for the number of cases, and once again for the number of hospital days (average length of stay). The difference can be recognised only by the title of the document in which the indicators are listed.
In order to address the described problems the SAD was designed. This database integrates the information from several Excel sheets into one single file. It contains meta information of about 700 health indicators, but not indicator data. The meta information consists of:

- indicator name (bi-lingual) and systematic;
- indicator definition (formula);
- components of each indicator (nominator, denominator, factors);
- references to similar indicators within the database;
- periods of indicator data availability;
- information on how the indicator data has to be submitted to international organisations; and
- other information.

For each indicator component the database holds the following additional information:

- component name;
- data source;
- accessibility;
- format;
- periodicity of data collection;
- delay, until data is available in IHIS;
- a status field which helps the indicator experts to follow up their work on indicator harmonisation; and
- a change log which allows the indicator experts to record the changes that they have made to each individual component.

Where possible, information is offered by selection lists, so that the user does not have to enter data manually. This supports a consistent terminology throughout the database, thus avoiding the problems mentioned above. The database also makes extensive use of commentary fields in order to support proper documentation of the entered meta information.

Installation
For optimum cooperation of the involved experts the data for the SAD need to be installed on a central server. The application itself should be installed on the local computer (workstation) to receive the best performance of the whole package.

Data File on LAN
The SAD data are stored in the file named SAD_back.mdb which needs to be copied to a directory on the server. This file will be shared by all users, i.e. all of them will work on the same data set.
All experts supposed to work with the SAD need read, write and delete permissions to this directory. The delete permission is required for removing temporary files. In order to protect the actual data file from deleting, it should receive the read-only

attribute set, and the experts should not have the permission to change attributes in this directory.

Application File on local computer
The file with the actual SAD application is called SAD_front.mdb. This file should be copied to a programme directory on the users computer and a short-cut should be installed (start menu, or desktop, or quick start bar) to start the application.
When the application starts for the first time, it will ask for the location of the data file. This needs to be selected from its storage location on the network, and then the application will run.

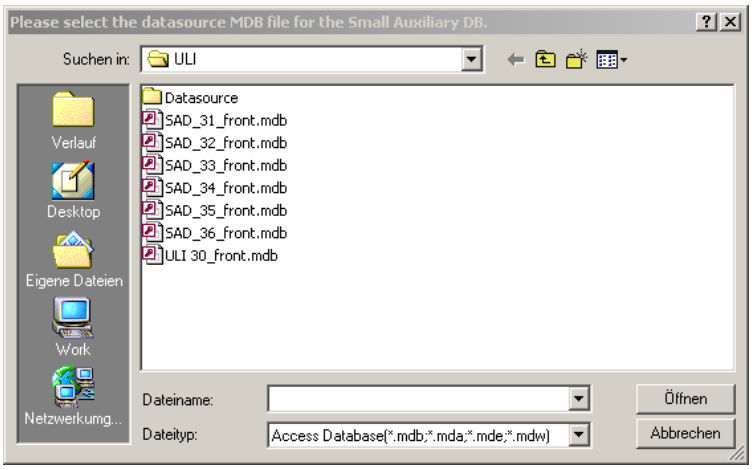

Figure 1: Choosing the location of the shared SAD data file

For consistency reasons it is recommended to name the data file SAD_back.mdb.

Working with the SAD
This chapter briefly describes how to use the SAD in preparing the information on indicators to be submitted to international organisations. This includes entering of the indicator meta data itself, but also editing of the related data and the creation of meta data reports.

The Menu System
After starting the application the main menu appears. The main entry operations can be triggered from this menu, and sub menus can be called for accessing other groups of functions.

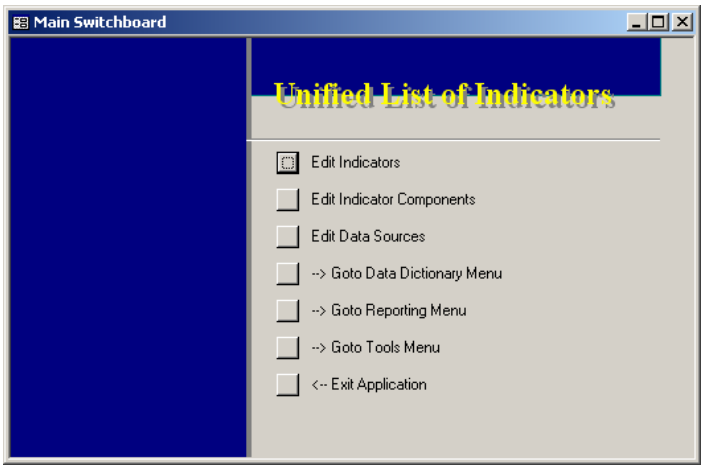

Figure 2: The SAD Main Menu

The menu items

- Edit Indicators
- Edit Indicator Components, and
- Edit Data Sources

lead the user directly to the respective entry masks. The use of these masks are described in this manual.

The other main menu items (with an → in front of the item description) lead to a sub menu. Submenu items are:

Data Dictionary menu
In the data dictionary, texts can be added or edited which shall later appear in the user interface of the programme. The dictionary contains a set of terms, which can be picked up from lists in the main entry dialogs of the application. Dictionary data does not deal with the indicator data directly, it only forms the vocabulary for the indicator descriptions and the underlying systematics. The motivation for this is to establish a consistent terminology throughout the database, so that the stored information does not become ambiguous. This manual describes the editing of dictionary data in chapter 0.

Reporting Menu
From the reporting menu it is possible to open a number of reports. These reports can be used to list indicator details and to display information about indicator components according to certain criteria, which also include a status field that indicates whether the work on that component is already completed or whether it still needs additional action.

Tools Menu
In the Tools menu there is currently only one command, which can be used to backup the contents of the database. After clicking the respective button, the following backup operation starts:

- The file SAD_back.mdb__xxx-backup01 is created in the same location where the SAD data file is located, usually in a directory on the server. The xxx stands for

the actual user name, i.e. if user Tomas is clicking the backup button, the file SAD_back.mdb__Tomas-backup01 will be written.
- If a file with the number ...01 already exists, it is renamed into ...02 and the file ...01 is newly created.

As a result, the latest backup of the SAD data exists always under the file SAD_back.mdb__xxx-backup01, and older backups under ...02, ...03, and so on. The maximum number of backups is 5.

If no user is triggering any backup manually for 7 days, the software will run automatic backups at programme start, and will repeat this process again after 7 days. The automatic backup files can be found in the same directory as the manual backup files, but under the names SAD_back.mdb__auto-backup01, ...02, ...03, and so on.
It is recommended that each user first triggers a backup, before he/she begins to enter larger amounts of data. In case that unforeseen things happen, or data is wrongly entered, the original state of the SAD can be restored from the latest backup copy. The automatic backup function cannot replace this measure of precaution, as these backups run only after 7 days and might not automatically contain a consistent database.

Entering and Editing Dictionary Data
It is recommended to enter the dictionary data, before entering the actual indicator information, because the entry windows make use of the available terms stored in the dictionary tables. However, it is no problem to enter additional dictionary terms later, when necessary.

The Data Dictionary menu is reachable from the main menu of the programme. It allows to access tables in which the terms are stored, in order to review and edit existing terms, or to enter new ones.

The following dictionary tables are available:
- Systematic Categories: These terms describe the systematics of indicators, i.e. whether they describe a process, an outcome, or a health determinant.
- Indicator Domains: The domain of an indicator describes its thematic subordination, i.e. the theme an indicator belongs to. Examples are: population indicators, health facility indicators, expenditure indicators, etc.
- Data Formats: These terms characterise the format in which the data is available (input) or sent (output). Each format has an abbreviation for easier use. Examples are: Excel sheet (XLS); spreadsheet data (CSV); Extended Mark-up Language (XML). - Data can be also available on paper, so that this is also defined as a possible format.
- Grouping Criteria: The criteria terms listed here are used to describe the stratification and grouping of indicator data, when they are reported. For instance, indicators are listed by age group or by geographic area. These "by" terms represent the grouping criteria. For each criteria it is possible to define an abbreviation, which later helps to speed up the work during entry of indicator data.
- Accessibility Descriptions: Source data for indicators are sometimes difficult, sometimes easier to access, depending on the method or institution providing the data. The descriptions of those accessibility possibilities can be defined as: examples: easy; difficult; only on request; special permission required; etc.

- Periodicity Descriptions: Indicators are calculated and re-calculated after certain periods, depending on the sources. Surveys have a different periodicity than the data retrieval from registers.
- Status Descriptions: The status terms are not required to describe indicators. They serve as a means for organisation of work of the experts working on the SAD. The status indicates, if a data source of an indicator needs further attention. Example of statuses are: needs clarification; documented; work done; etc.

The dictionary dialogues are very similar in their design and usage. Each of them contains a number of lines, whereas each line holds the information for one single term. The dialogues for editing thematic domains and grouping criteria of indicators are given in figures below.

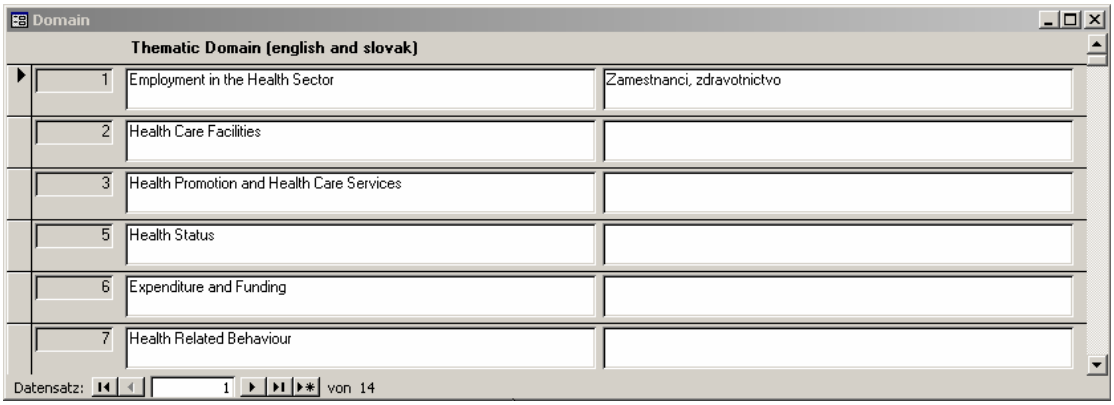

Figure 3: The dialogue for editing thematic domains of indicators

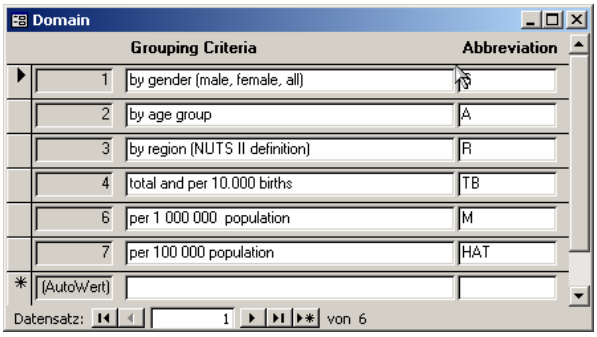

Figure 4: The dialog for editing the grouping criteria of indicators

The grey fields on the left are not editable, as they contain the internal record ID, which is automatically assigned by the system. The next fields contain the textual description, i.e. the actual term. In the third column, additional information can be entered. In case of the thematic domains it is the Slovak translation of the term and in case of the grouping criteria it is an abbreviation.

Entering Indicator Meta Data

This section of the manual describes the practical steps for the main function of the SAD, i.e. the mask for entry and editing of meta data on health indicators.

The mask can be reached directly from the main menu of the programme. By clicking on Edit Indicators the following mask opens:

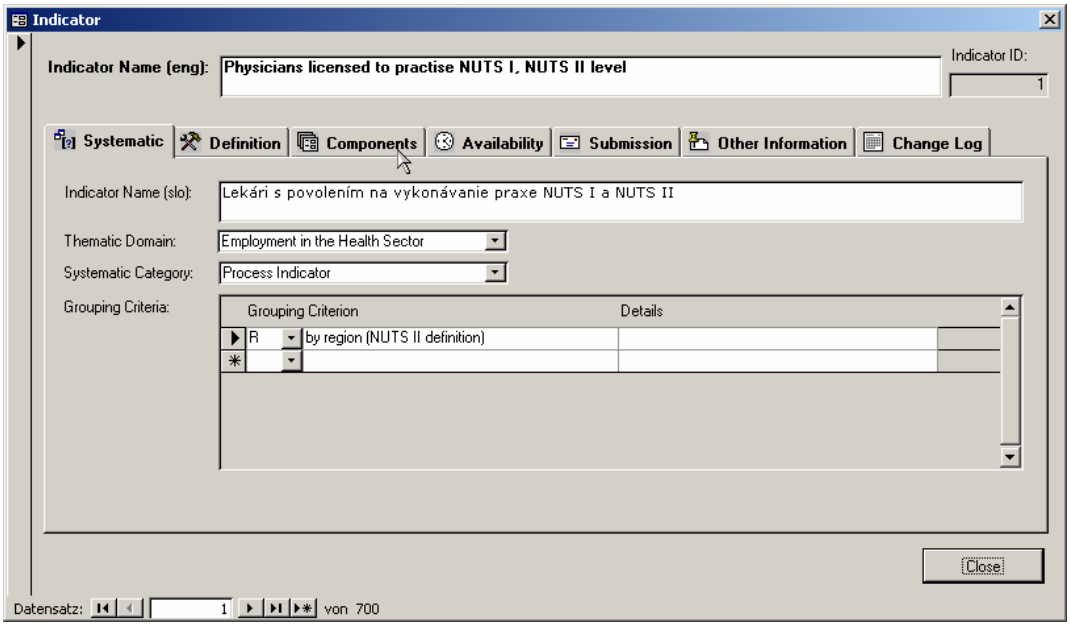

Figure 5: The Indicator mask with page for systematics

The mask shows information on one single indicator distributed over several pages. Further indicators can be displayed by clicking the navigation buttons in the status line of the mask.

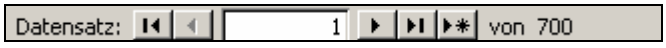

Figure 6: Navigation buttons

The buttons can be used to change from record to record in both direction, or to jump to the first and last record. By entering a number in the text field the respective record number will be shown.

At the top of the mask there is a text field for entering the name of the indicator in English language. Beside it on the right side there is the ID number of the indicator. It is assigned by the SAD programme automatically and cannot be changed. This ID is often referenced by other elements of the SAD and in reports.

Please note: The record number displayed in the navigation bar is not the ID of the indicator and will change if an indicator is deleted. Instead the Indicator-ID on the top has to be used for a numeric definition of an indicator.

The mask contains several pages, each of them covering a specific set of information for the indicator shown. These pages are:

Systematics
In this page the Slovak translation of the indicator name can be entered. Below this, there are two dropdown lists for the thematic domain and the systematic category of the indicator.

The lowest element of the page is an entry field for the grouping criteria of the indicator. This criteria is used to group indicators according to certain parameters, for instance by region, or by age group. Usually these parameters need a further explanation, for instance the intervals of the age group, or the NUTS level of the regions. These details have to be entered, too.

The criteria can be chosen by selecting an abbreviation from the dropdown field. This field displays terms which were previously defined in the data dictionary (see above). In the next step the details are to be entered into the text field. Indicators are often grouped by several criteria. In this case these all have to be entered one after another.

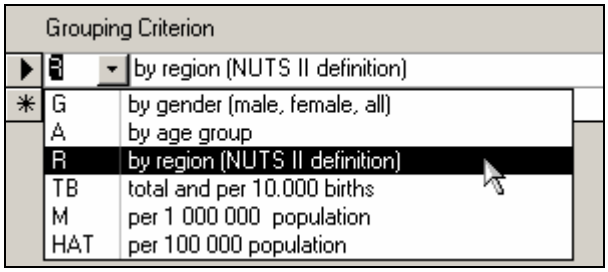

Figure 7: Selecting grouping criteria

Definition
In this page the actual way of calculation of the indicator is described. The first text field contains the mathematical formula, whereas each component is represented by a letter. These letters are then referenced in the description of the indicator components (next page of the mask, see further below).

A short description of the indicator can be entered into the next text field. Below this there is an entry field to enter references to other indicators. These usually point to indicators of similar content or identical calculation, or indicate indicators which are related otherwise.

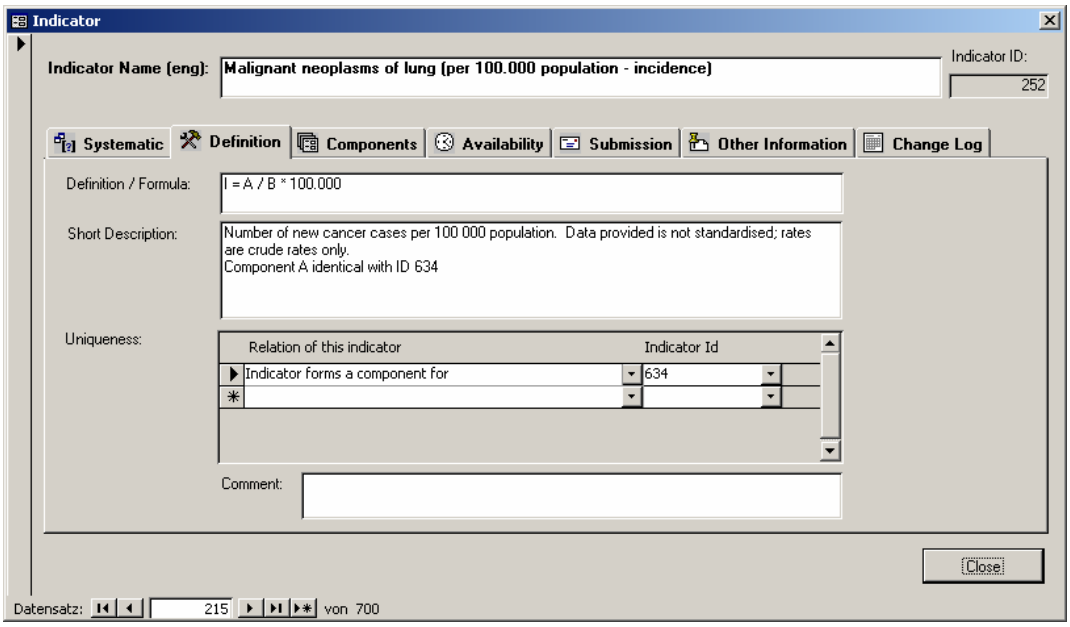

Figure 8: Indicator Definition

Components
An indicator is calculated by help of its components. An index letter characterises each component and is referenced by the indicator formula. The components are to be selected by a dropdown list; and the programme shows the details on this component automatically.

The components are to be edited by another mask of the programme. It can be reached by two buttons:

1. Edit Marked Component: opens the component mask with the component currently highlighted in the list
2. Edit Components: opens the component mask with all components

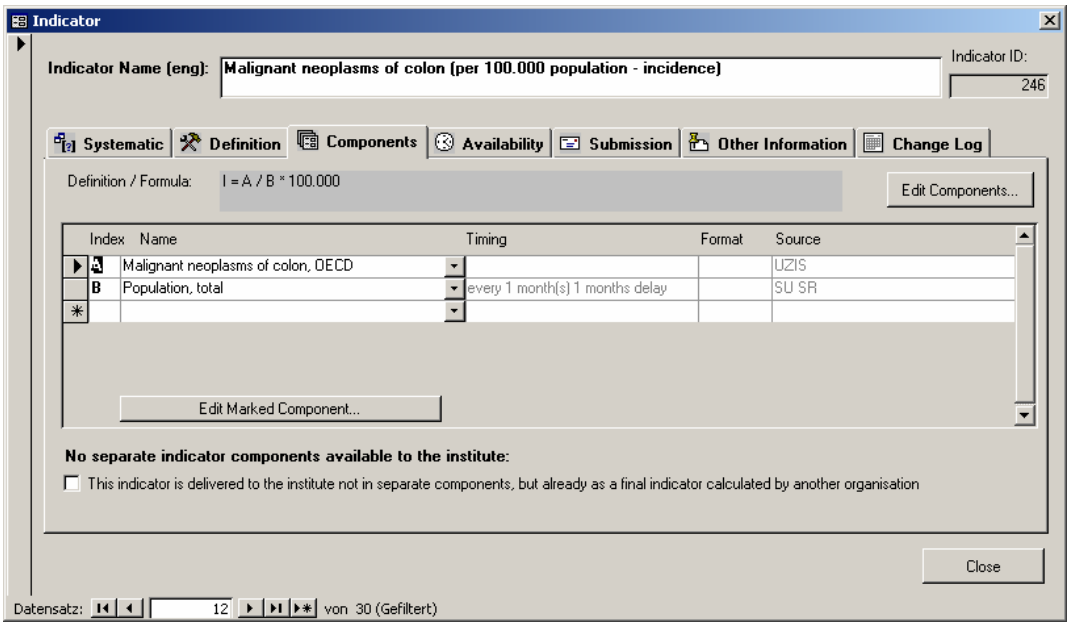

Figure 9: Indicator Component

Below the component entry field there is an option box. It indicates, whether a certain indicator is delivered to the IHIS already as a pre-calculated indicator, so that it has either no components, or does not need to be calculated by the IHIS.

Availability
On the availability page the SAD shows information about the periodic existence of an indicator. Firstly, it shows the years in which the indicator was calculated, while the recalculation period of the indicator is to be chosen from a dropdown list. The content of this list comes from the respective dictionary table.

The availability refers to an indicator, not to its components or sources. It shows when and how often an indicator is calculated. If the periodicity of the components is shorter than the availability intervals of the indicator, the indicator can always be calculated with fresh data.

Submission
Under the submission page it is possible to enter the international organisations to which the indicator must be sent. The organisation and the format of the specified information can be chosen from a list. The list of available formats shows the elements previously entered in the data dictionary tables.

Other Information
This page of the indicator mask provides additional information not directly necessary for the systematic organisation. However, for the convenience of the users, the following fields were included:

1. comment on indicator, which is a field for keeping free text on the indicator;
2. thematic domains as they were originally used by the lists which were given from the IHIS to the project team to analyse the indicator situation. In most of the cases, there will be only one of the three dropdown lists used (usually the one that indicates to which organisation the indicator data has to be submitted).

Change Log
The change log page serves as a tool to record and follow up changes made in the individual indicator records. This allows the users to identify responsible persons and to ask them for clarifications if needed.

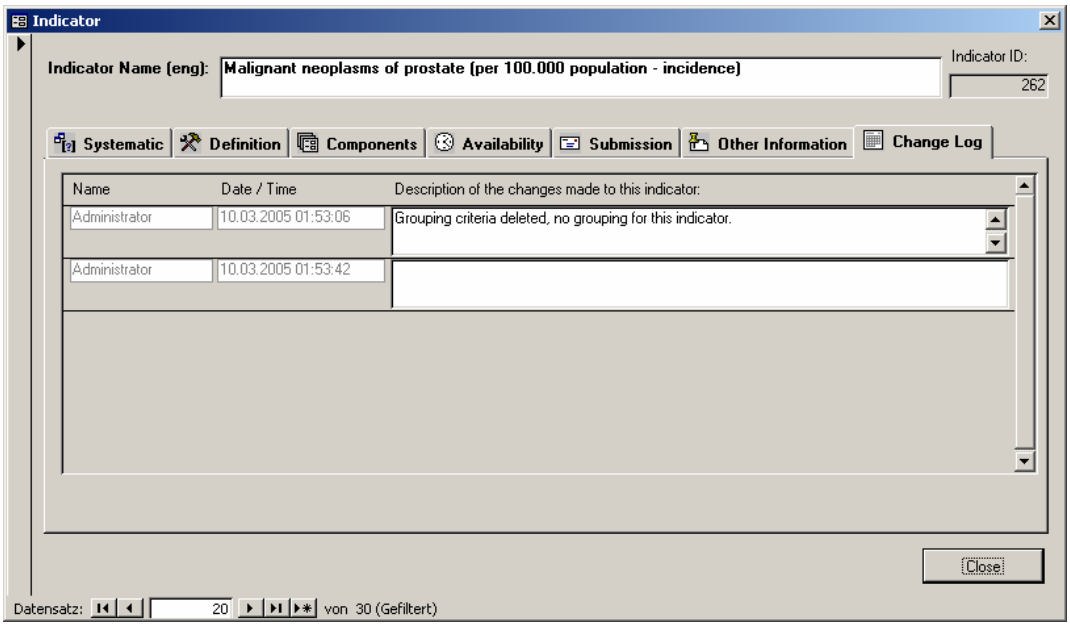

Figure 10: Change log for an indicator record

The name of the user is read from the network username and is automatically filled in as well as the current time. Then the user has to enter a descriptive text for the changes he/she has made and wants to document. It is up to the individual SAD user to decide whether he/she wants his/her changes logged or not, but it is recommended to add information here, because it clearly improves the possibility to follow up changes and ensure the quality of the recorded data.

Entering Indicator Components
Indicator components are the elements required for calculating a certain index, for example the number of hospital days (component 1) and the size of the female population (component 2). Each such component has a source from which the data come in a certain periodicity and format. It is possible to change from source to source by use of the navigation buttons from the status line area of the entry mask. The mask is structured into four pages, each of them holding part of the information on a single component.

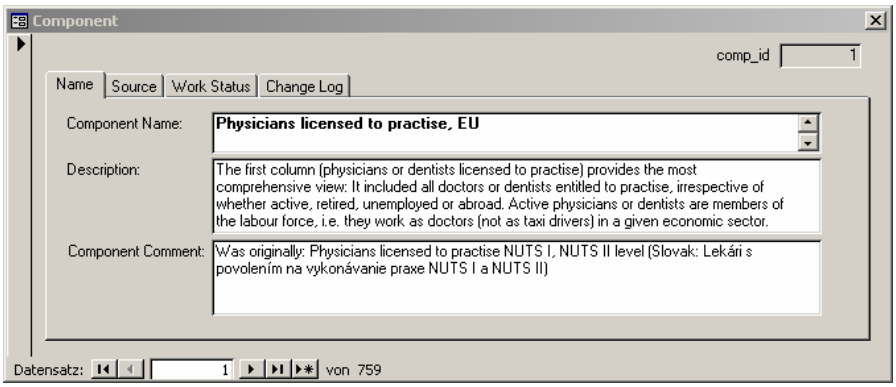

Figure 11: The Component mask with page for basic information

In the first page (Name) the basic information on a component, the name of a component (only English), a description and a basic comment are recorded.

The second page contains the information on the component's source, i.e. the institution where the data comes from, their accessibility, format and timing. The timing is characterised by 2 fields, the periodicity and the delay. The periodicity indicates how often an organisation provides the data, while the delay shows how long it takes until the latest data arrive at the IHIS.

The Work Status page contains a list of situations describing the current affairs of a component in terms of recording it into the SAD. It does not describe the situation of the component itself (for this the comment field on page 1 should be used, see above). - If necessary, there is also a comment field for a more detailed description of the work status. - The contents of the work status list (on the left) derives from the data dictionary tables.

The fourth page of the component mask holds a change log similar to the indicator change log. For details, please refer to the description given there (see above).

This section of the manual describes the practical steps for the main function of the SAD, i.e. the mask for entry and editing of meta data on health indicators. The mask can be reached directly from the main menu of the programme. By clicking on Edit indicators the following mask opens:

Entering Data Sources

Each indicator component - and not automatically the whole indicator - has one single source, where the data come from. Indicators can have several components and, thus, several data sources.

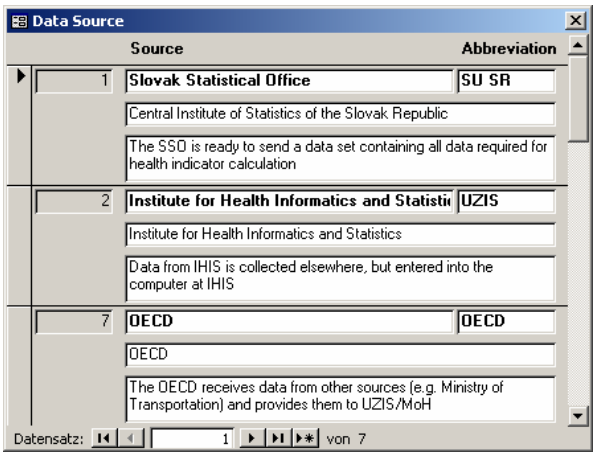

Figure 12: Data Source entry mask

The mask for entering information on data sources looks similar to the dialogues used for the data dictionary tables. It contains a list of single records with the following fields:

1. Name of the source, which is the name of the institution where the data is collected
2. An abbreviation for the source to make it more convenient to use
3. Long name for the institution

Exit the SAD application

The SAD database application can be closed from the main menu, menu item Exit Application.

Results:

- ***On-the-job training provided by STE1 and STE2 during their missions in 2005.***
- ***A final training workshop carried out by PL and STE 1 on 15th March 2005.***
- ***A training manual for further usage of the SAD***
- ***Training manual translated into Slovak (see Annex 4).***

Activity 4: *Pilot testing of the new system*

The MS expert will provide the pilot project. In cooperation with employees of Data centre (MoH SR and IHIS included), he/she will collect, evaluate and analyse health data during the final month of the project according to the instructed methodology. Data will be finally provided in relevant form according to current requirements of EUROSTAT, OECD and WHO.

HW and SW for the new pilot system was planned to be tendered parallel to this project. While the HW tender has already been launched, the SW tender will be

published later in 2005. This implies that the SW will not be developed within the timeframe of the Twinning Light Project. Thus it has been decided that the pilot testing will be executed by IHIS as soon as possible after the end of the project (Addendum 2). Activity 4 therefore has been redefined as follows:

Activity 4.1

Pilot testing of the new system
The project experts will collect, evaluate and analyse health data according to the relevant methodologies. Software testing will be prepared by training of staff on software project management and the development of a pilot project implementation plan for the software.

Pilot Study:
As presented in the summary on activity 2 the SW to be developed under a separate TA contract will be built up with the help of a modern SW development methodology. This methodology will include a cyclical process, under which the product is developed in iterations, i.e. in planned steps following pre-defined milestones. After each iteration the development team will carry out module tests and integration test, so that it is guaranteed that the system grows with a minimum of errors still existing in the product. From time to time acceptance tests will be performed, where the developers will present the functions of the current iteration. During these tests a current prototype of the system will be presented to the MoH and IHIS, or its representative and demanded functions will be tested against the specifications.

This state-of-the-art process ensures that the design specifications are fulfilled during the creation of the SW , and most of the development errors will be detected and removed beforehand. As a consequence, the pilot study to be executed after finishing the SW development must not include large SW tests anymore.

The essential task of the Pilot Study must be to test and evaluate the application of the SW in its daily working environment and to draw conclusions from it. It has to be tested whether the users are able to include the tasks connected with the new SW and whether they can be included in their daily work, or which measures need to be taken to render this possible. Expected measures are:

1. training for using the SW ;
2. further education of the users towards better analytical capacities;
3. shift of responsibilities; and
4. reorganisation of work.

Pilot scenarios should be designed and carried out during the pilot study. This is not the task of the SW development team, as its duty is only to deliver an error-free operational SW, while the pilot study has to reveal whether the work procedures and cooperation between the MoH and IHIS are adequate to make best use of the new SW.

The intended function of the new SW is to support the preparation of reports on health indicators to international organisations as well as to provide health data for

analytical reports and studies. Therefore, the pilot study has to cover tasks from the following work fields:

5. data entry and/or data import;
6. data exchange between MoH and IHIS;
7. generation of reports and output files;
8. sending data to international organisations;
9. evaluation of the feedback of international organisations;
10. evaluation of the results of the other piloted tasks;
11. evaluation of the analytical tasks carried out; and
12. assessment of the training needs of users.

In all these tasks the essential focus of the pilot study must not lie on the technical function of the SW , but on the assessment of the user's needs and the analysis of the work processes related to them and supported by the new SW.

To execute the pilot study the following steps need to be taken:

- Assigning responsibilities: selection of a pilot study manager and management assistant; it is recommended to choose an expert from IHIS with experience in health data reporting and international cooperation;

- Decision on the participants: it is recommended to keep the number of participants low, but to include at least one person from each work field (economic indicators, health status indicators, facility indicators,...) involved;

- Definition of pilot study results: it needs to be defined in written form, which operations shall be piloted and what results shall be achieved in each of these operations;

- Definition of verifiable indicators for measuring the piloting results;
- Preparation of a pilot study activity plan and time schedule;
- Definition of reporting obligations and time schedule;
- Execution of the pilot study;

- Evaluation of study results: this can be done by assessing the study reports prepared by the participants, or by holding a number of workshops where the results will be assessed in a participatory approach; and

- Preparation of the final pilot study report by the pilot study manager, including recommendations to the management on technical and/or organisational measures to be taken.

Activity 4.2

Support to the development of OECD's system of Health Accounts
The project experts will amend the database with the OECD indicators. They will work with experts from the Statistical Office and IHIS on developing selected OECD indicators based on the OECD methodology.

The System of Health Accounts (SHA) builds on a consistent *functional approach* in order to define the boundaries of the health system. This approach is "functional" as it refers to the goals and purposes of health care such as disease prevention, health promotion, treatment, rehabilitation and long-term care. The SHA requires the accounting of expenditure spent on these functions, no matter whether their providers are considered as health care organisations or institutions outside the health sector in national statistics. This wider definition of the health system includes long-term nursing care services that were traditionally considered as social services in many countries.

The most preferable approach is bottom-up and function oriented. Nevertheless, the choice of the approach will generally be dictated by the type of sources that are available, which are in turn usually determined by the type of health care system in place and the type of the pre-existing accounting framework. For practical reasons the Slovak organisations involved in the project - IHIS as well as the SO SR - chose a two options strategy. They started with a top-down approach, which was function oriented and financing agent based with the plan to switch to a bottom-up approach as soon as possible.

Selecting indicators means – first of all – to compare the existing national indicators with the OECD recommended ones. The working process followed the recommended steps for a top-down approach:

1) Understanding the health care system under study
2) Investigating data sources
3) Creating a Health Accounts database
4) Resolving issues
5) Filling the tables

In different meetings at the IHIS (26.10.05, .10.05, .01.05, .02.05, 08.03.05) the suggested flow of payments in the Slovak health care system was analysed, possible data sources were identified and evaluated to be used as a basis for the OECD tables.

This step resulted in different overviews of indicators and data sources classified according to availability and departures. Further analysis of IHIS working papers showed that there are many departures between the two classification schemes. The papers not only analysed the differences but made also recommendations to solve some of the disparities. Nevertheless the descriptions of the indicators are one-dimensional, only. Which means that - due to the high number of indicators and the numerous links - a tool would be needed to store all information on the availability, primary sources, departures and possible interpretation of data. For that reason we recommended to set up an auxiliary database that should integrate all data. This idea

was also discussed and cross-checked with representatives of the SO SR (03.02.05), Mr. Foster from the German Statistical Office in Wiesbaden (04.02.05), M. Schneider from BASYS (04.02. 05) and D. Kawiorska from the University of Krakow (19.02. 05) in principal they shared our conclusion.

Main outcomes of the meeting with SO SR and IHIS on 03.02.05:

- A cooperation is highly appreciated. Working papers from Mr. Cincura were handed over to Mr. Baxa and were compared with the SO SR approach. Further exchange of working process results is agreed upon.
- ICON is working on a "roadmap" (June 2005). The aim of the project is similar to our goals. ICON obviously wants to set up what we called standardised operating procedure (SOP). The SOP will not only describe the collecting and processing of data, but will also describe the cooperation between institutions and possible interfaces.
- The representatives from SO SR were highly interested in such a database.

During our last meeting with IHIS and SO SR we learned that several meetings took place between Mr. Cincura and Mr. Baxa where the results of the analysis of the indicators were exchanged and finally agreed upon. Therefore we can say that the following description is the shared view of IHIS and SO SR.

The results of the working process up to now:
The IHIS collected and classified data according to the three dimensions for health expenditures, namely by functions, financing units and providers. IHIS described major tasks of the development of the NHA , i.e. (basic principles, terms, classifications and rules for accounting) and the development of a conceptual framework of the NHA adaptation of concept seems to be a demanding task . It has to be pointed out here that such an adaptation is not a routine task carried out mechanically. It requires careful comparison and harmonisation.[2] For reasons of complexity due to the combination of indicators, the information on departures or congruency, a database would be a helpful tool.

Summary information and outstanding issues [3,4]

- As result the type of health care in the system of health accounts is understood in a broader and more differentiated way, now. The personal health care is divided in several parts, **according to the function** it performs in the health care system: therapeutic (curative), rehabilitation and long-term nursing. Each function of the personal health care is simultaneously classified **according to the way** it is provided, i.e.: inpatient (beds), day, outpatient, home.
- Such a complicated classification represents a substantial source for inconsistency compared to the Slovak taxonomy, because terms such as e.g. outpatient or inpatient (beds) care have a different meaning, or there are

[2] Brasenova, Institute of Health Information and Statistics Department of Information and Publication Services, SLOVAKIA Contribution to SHA Working Paper, Activities of IHIS since 2001 – 2004, June 10, 2004
[3] Cincura, IHIS, Summary information and outstanding issues, IHIS, SHA , Bratislava, June 2004
[4] Brasenova, ibid

differences in the definition of their specification. Border lines of outpatient care are, for example, different than in our statistics. The same notion does not necessarily mean the same definition and the same concept of the indicator.

- The structure according to the type of health care does not correspond to the classification that is still being used in our country. The system of health accounts understands the function (type) of health care and health care provider as two totally independent dimensions, whereas within our statistics these dimensions overlap. In our country the personal health care is not thoroughly classified according to the way of payments (expenditure) for bed, outpatient and long-term nursing care. This significant difference represents a major problem when utilizing our statistics for the SHA. It does not facilitate the development of relevant indicators by the so called "filling in from the top" .
- Another problem is the classification of personal health care (both outpatient and inpatient) according to its function. Our statistics monitor health care in general whereas the focus lies on medical (therapeutic) care. Rehabilitation and long-term nursing care are not separated from this focus.

- The given anticipation methodology for computation of gross capital formation will have to be further elaborated, specified, described in detail and justified. In some respects it is based on economic instinct and knowledge rather than on strict accounting. The computation method must cover general issues, however, it must offer a provident, simple clear and understandable application method. In turn, this should similarly apply to the whole system of health accounts, provided it serves the objectives it was developed for. However, in fact reality is a lot different than all those - even most sophisticated - methods.[5]

Overview on indicators

The following table gives an overview from the viewpoint of OECD on the available data. The yellow areas show the areas to be worked over; blue means that data has to be updated, red means that there are problems of definitions and/or availability.

Country:	SVK	*(ISO Country Code)*
Core Variable Status		
About this page: This front page is meant to highlight the availability of core variables in the questionnaire. For each variable listed here, the automatic links can give 1 of 3 messages: *1) "No values reported at all" - the variable is entirely empty 2) "Please update up to 2002" - there are observations, but not up to and including 2002*		

[5] Štefan Činčura, Analysis of the current approaches to determination of the capital formation in the health care provider institutions and draft methodology of its computation**,** Bratislava, November 2004

3) "Variable is up-to-date" - Data exist for 2002

Please do not make any comments on this sheet. It is only here to serve as an automatic overview.

Expenditure on health

Total:	Variable is up-to-date
Public:	Variable is up-to-date
Private:	Variable is up-to-date

Current expenditure on health

Total:	Variable is up-to-date
Public:	Variable is up-to-date
Private:	Variable is up-to-date

Investment on medical facilities

Total:	Variable is up-to-date
Public:	Variable is up-to-date
Private:	No values reported at all

Health R&D

Total:	No values reported at all

Expenditure on prevention and public health

Total:	Variable is up-to-date

Expenditure on curative and rehabilitative care

Total:	No values reported at all

Expenditure on long-term nursing care	
Total:	No values reported at all

Expenditure on in-patient care	
Total:	Variable is up-to-date
Public:	Variable is up-to-date
Private:	No values reported at all

Expenditure on outpatient care	
Total:	Variable is up-to-date
Public:	Variable is up-to-date
Private:	No values reported at all

Expenditure on pharmaceuticals and other medical non-durables	
Total:	Variable is up-to-date
Public:	Variable is up-to-date
Private:	Variable is up-to-date

Total current health expenditure by provider	
Hospitals:	Please update up to year 2002
Nursing:	No values reported at all
Ambulatory:	Please update up to year 2002

Expenditure by source of funds (Part 5)	
Gen.gov.	Please update up to year 2002
Soc.sec.	Please update up to year 2002
OoP	Please update up to year 2002
Priv.ins.	Please update up to year 2002

All other	No values reported at all

4. Evaluation of the Twinning light project

Cooperation at the working level:
The cooperation at the working and organisational level with both the MoH and the IHIS was very productive: The Slovak side was supportive in identifying materials and sources of data, making appointments with and travelling to other institutions, preparation of translations, providing Slovak – German interpretation, equipping and maintaining functional workplaces in the IHIS and establishing a friendly, open, and cooperative atmosphere.

Achievements:
Despite the difficulties that had to be overcome at the beginning of the project, signified by two addenda becoming necessary to adapt the original ToR to the factual conditions, the objectives of the project were reached:

- The project team contributed to the completion of the harmonisation of the collection, processing and evaluation of health data (annex 5) and developed new technologies i.e. a database of health indicators (annex 4) allowing for a system that is consistent with the standard methodology applied in the EU and capable to provide all relevant health information in the specific data structure requested by EU institutions, OECD and WHO.
- An experts' working group (consisting of MoH, IHIS and MS expert/experts) was established in order to specify technical requirements for the HW (2) and SW (annex 3) to be developed for the analysis and evaluation of the new health indicators in accordance with new developed methodology. In terms of new software requirements, software and equipment of the IHIS can now be upgraded for increasingly sophisticated operations of collecting, processing, and evaluation of health data.
- Responsible employees of IHIS were instructed personally on the use of the new methodologies and system of re-defined health indicators in their practise. In addition an operations' manual (annex 6) was provided and presented in a seminar so that there is no need for future assistance.

SW testing was prepared by instructing staff on SW project management and on the development of a plan for SW assessment (annex 8).
Support was given in close collaboration with the SO SR and IHIS to amend the database with selected OECD indicators for SHA(annex 7).

The long-term success will depend on the structural adjustments recommended, and on cooperation with other relevant agencies, as well as on the availability of additional resources as outlined below (section 6).

5. Conclusions and Recommendations

For the further implementation of the achievements and for the continuous development of the system implemented, proposals for structural improvements and additional resources are presented:

A. General remarks:

1) Slovakia has – like many Eastern European countries in transition – traditionally a relatively well developed system of medical statistics. With regard to international reporting a clear division of responsibilities is well established as the SO SR reports to EUROSTAT and IHIS reports to OECD and WHO. Some of the information is already being mutually exchanged although in a technically rather limited manner due to insufficient cable connection. However, Slovakia is in the position to consider playing a more proactive role in to health statistics in the EU harmonisation process. In order to improve the linkage between the two Slovak institutions it may be advantageous to delegate representatives of SO SR as well as of IHIS together to the respective EU/OECD/WHO meetings.

2) In order to enhance the inter-institutional collaboration within Slovakia we recommend that the MoH establishes a Liaison Committee (LC) between the constitutional lead institutes such as IHIS, National Bank (NB), National Labour Institute (NLI), National Oncological Institute (NOI), Public Health Authority of SR (PHA SR), SO SR and – potentially – the Faculty of the Public Health (FPH) at Trnava University as the research and teaching branch working with the provided information on health issues. If a common representation of the (five) health insurances (HI) in the country can be organised they should also be included. The level, however, should be higher than that of e.g. the Interbranch Expert Group on the SHA.

Table: Present responsibilities of Slovak Lead Institutions

	MoH	IHIS	NB	NLI	NOI	PHA SR	SO SR	HI	FPH
Health targets	X					X			
Mortality							X		
Morbidity		X		x	X	X		x	
Behaviour (HIS/HES)							X		
Institutions		X							
Environment						X			
Services (incl. labour force)		X			X			X	
Financing			X				X	X	
Short-term analyses	X								
Routine analyses		X		?	?		X	X	

Thematic reports		X		?		?			X

Scenarios, Public Health research									X
Health accounts		X					X		
International representation	X						X		

The MoH can use the LC to set annual priorities and to request topical thematic reports and scenarios, which can then serve as basis for the decision making process. It can also coordinate better international representation. In addition, the LC can become instrumental in developing the necessary components of a consolidated Slovak National (Public) Health Strategy.

In connection with the World Bank (WB) project a central institute or analytical warehouse for data collection is under discussion and likely to be established during 2005. It seems that this institute will take over the key responsibility for the coordination of health information provided by various sources and for the international reporting making use of the LC , as suggested.

3) The introduction of the SW Database will automatically perform many of the present tasks of IHIS. Therefore and because of changing demands a clear shift of priorities regarding quantitative and qualitative capacities towards health policy support (health promotion and intervention programmes as an own department or as a separate agency for health promotion) is highly recommended. The relative resource allocation between dealing with infectious and chronic diseases must also be reconsidered (the budget for chronic diseases should be twice as high as the one for infectious diseases). Necessary retraining and reorientation of staff ("skill shift") can be supported by a closer cooperation with the FPH and similar academic institutions. In addition, it is essential to provide attractive positions for at least 3 public health professionals (international MPH or MSc) qualified in epidemiology, statistics and health promotion. The head of the respective unit (IHIS or "Analytical Warehouse" should be formally qualified in public health management (PhD). An additional approach to mitigate the competence gap is to establish complementary international cooperation, e.g. with neighbouring countries.

4) The MoH should delegate the full responsibility and the budget for the implementation of health monitoring and reporting to its institution of choice (IHIS, "Analytical Warehouse" or else). The MoH should appoint the head of this institution. The institution should report to the MoH on its outcomes, successes, problems, efficiency in improving the health of the population in Slovakia, on the current health status and development, as well as on the utilisation of the budget. It should be independent in its way of solving problems and in the distribution of the budget within its structure.

5) In order to improve the links between the provision of health statistics and their wider utilisation by decision makers and researchers the production of thematic reports in cooperation with specific competent institutions is suggested. We especially recommend cooperation with the School of Public Health or FPH and the HI The reports published for North Rhine-Westphalia may serve as a basis for such thematic reports (see: www.loegd.nrw.de).

6) In order to give thematic reports a specific direction a national (public) health strategy should be developed and authorised by governmental decision or preferably by parliamentary vote. A national strategy should contain national health targets and the definition of the means and resources as well as a timeline for achieving them (action plan). Appropriate legislation should follow the strategy but should also allow sufficient flexibility to adapt to changing priorities in health policy. (see also: National Health Targets and a system of Health Conferences acc. to the model of North Rhine-Westphalia).

7) Basic skills must be developed, like researching, evaluating, utilizing relevant (recent) scientific literature, writing scientific publications, other types of texts or communications useful for politics or the general public. With respect to human resources and personnel development, the EU Decision No 1786/2002/EC of the European Parliament and the European Council of 23 September 2002 adopting a programme for Community action in the field of public health 2003 – 2008 (e.g. Article 3 d and related paragraphs) offers attractive opportunities which should be used for continuous education and personnel development.

8) A regular internal exchange on findings or publications and meetings for continuing education must be established.
The structure of regular reports

- Health monitoring and reporting should react on actual developments with specific reports. There has to be a clear definition of the general structure of the reports in order to enable a timely reaction and a quick publication.
- The reports from health monitoring should concentrate on the Slovak health targets. The targets are chosen by the Slovak authorities and represent a list of health aspects which are currently considered to be important. The report should provide one chapter for each Slovak health target. Each chapter should start with the presentation of the main indicator, deriving directly from the formulation of the target. This indicator can illustrate a trend and can be directly compared with the target. Prognostic calculations are also possible. Hence, it can be easily judged, if the target will be reached until 2010 or at a later stage.
- After the description of the aggregated indicator there will be presentations of the numbers, which are behind the calculation of the indicator, e.g. trends for Slovakia and EU-15 and which will deal with target one. The next two chapters could give a benchmarking against comparable countries and – as far as possible – regional differences within Slovakia.
- Based on this information an assessment of the trend, some remarks on possible reasons and hints for meaningful fields of further action can be worked out

and presented. Each chapter should end with a description of the available data and suggestions, which data would be necessary for the assessment of the target.

- For a good result it is crucial that the group and its task is accepted by those institutions which have to contribute to the monitoring by data and by analysis of special questions which may come up in the monitoring process. This acceptance must to be (supported) by politicians who are for the monitoring and who discuss and use the reports in their work.
- High quality monitoring needs international cooperation and a scientific background. A close cooperation with the FPH to support the exchange of results, methodological questions and data requirements with similar groups in EU and in neighbour countries is strongly suggested.

Next steps should be the development of an outline of the first report, the development of the internal structure of the chapters, the setting of priorities for the topics, the involvement of other centres and agencies contributing to the monitoring, producing and reviewing of reports. This process should be carried out step by step, starting with the report on mortality, and life expectancy in Slovakia, including the potential years of life lost.

9) For its modernised task profile the IHIS needs direct access to a modern scientific library and relations to other scientific libraries, e.g. of the University, as well as access to several important international (including epidemiological and public health) journals via the internet. A common library for all public health agencies and centres as well as the FPH should be considered.

Specific Recommendations

Activity 1:

- With regard to not available or not comparable indicators the project "Health information data centre[6] should be contacted. As this project works together with health care providers and insurance companies it might have some influence on the data, provided by those institutions.

- A comprehensive study has been repeatedly suggested to analyse differences between officially published WHP-HFA data and the domestic Slovak database with regard to data sources, meta-data information and information channels (Mr. Prochorskas/Mrs. Sedlakova, WHO).

- For the assessment of the mortality statistics, with special reference to the causes of early death and its monitoring, the concept and method of potential years of life lost (PYLL) should be introduced (German Federal Office of Statistics ("Statistisches Bundesamt", Bonn; Serbian Burden of Disease Study). This would change the understanding of the causes of death statistics significantly, and should be one of the key indicators of health monitoring.

- The SAD is a suitable instrument for the programmers of the software and a tool to store meta data information on health indicators. In addition the SAD can be used as meta data information system for national indicators.

- Meta data information of all indicators has to be examined and supplemented by the Slovak experts. One employee should be responsible for content related aspects of the indicators transmitted to EUROSTAT, OECD and WHO.

- In addition IHIS is encouraged to consider systematic separate quality assurance measures including the extended description of data validity (to be saved in the new meta-database) and of the concordance of numerator and denominator regarding their population base (as a precondition for the calculation of rates); see also case and person based data). To that aim the primary data source(s) for each indicator have to be identified (Data source inventory).

Activity 2:

- It is essential to maintain the professional control over the further process of tendering (IHIS representatives should be members of the evaluation committee) and the methodology of health indicators.

- It is understood that the new IT system will effectively link GovNet and HealthNet allowing authorised access to all health databases (incl. meta-data-information) incl. those hold by the SO SR, NB, NOI, PHA SR, and NLI.

- It is noted that in a related effort the HealthNet between the health institutions in the country (hospitals, practising physicians, regional institutes of public health), IHIS and the PHA SR should be improved to provide a permanent, reliable and fast communication.

- In this context it is recommended to assess the potential of STATEL for automated data exchange between SO SR and EUROSTAT and between IHIS and SO as well as between IHIS and data sources

- The existing network capacity is insufficient for the new tasks envisaged. Fibre cables in the new building of IHIS will solve the problem.

It is recommended to check and to amend the SAD to the greatest extend possible before the programming unit of the SW company in charge begins its work. This is especially true for the economic indicators under consideration and is of great importance if the amount of later corrective and/or additional programming is to be minimised. Those staff with full access rights (i.e. also right to change contents) should meet once a week to coordinate information changes in the database). Staff competence should also be enhanced by training them for Access (by Mr. Tilniak?) in a short-course. One employee should be responsible for the technical support of the SAD (back-ups, technical questions etc.).

- The meta-data information should be available on the Internet (MoH) in order to support data exchange, motivate for further cooperation, systematise scientific evaluation, and raise awareness.

- Establish hyperlinks (Internet) from the indicator descriptions to actual data sources (see: www.loegd.nrw.de).

- For the SW development an expert/project manager for supervision of the process must be made available (he/she must be able to read and understand deliverables produced by the programming team).

- A concept for the system operation (Standardised Operating Procedure - SOP) has to be developed and responsibilities must be defined in order to guarantee sustainability.

- The TWL team agreed to examine the possibility of a scientific publication of the experience with the Database.

Activity 3:

- A coordinator for the in-house continuous education should be appointed and should be responsible for a regular training programme comprising at least 10% of working time.

Activity 4:

- There is a trade-off between the amount of time allocated to compilation and other aspects of quality, such as comprehensiveness, validity and credibility. Of course, there is a point at which a dataset is considered too poor to be included as part of the compilation process. However, it is clear from previous experience that no data source is perfect. The compilation of Health Accounts (HA) is an ongoing process, involving a continuous development cycle. In the planning phase, it is very important to be informed about the initial desired quality of the accounts, since this will have an important effect on the resources required by the project.
- The accounts should be built up from detailed data sources, the so-called,bottom-up approach, but in the first development round(s) some components may typically be estimated using so-called, top-down approaches, whereby existing health expenditure aggregates are broken down according to the availability of proxies and other estimation techniques.
- Over time, as HA are redeveloped, compilers should aim to replace top-down with bottom-up methods.
- An important issue to be kept in mind is metadata information as an aid to compilers in subsequent HA development and compilation rounds. It is important to present next to the tables descriptive information which explain the methods which have been used in order to obtain the figures. In particular, it should be pointed out which parts of the table are of particular concern regarding quality, and the nature of this concern. Credibility is enhanced through the honest description of issues and problems. It also promotes the improvement of information as data suppliers begin to understand how their information is used and strive to make improvements.
- The setting up of a team with dedicated staff rather than ad-hoc project workers is also a key part of institutionalisation. Metadata should be attached to the tables and indicators, to make sure that the correct understanding of the indicators is independent from personnel and valid over time (see data base from Mr. Breckenkamp).

Further tasks

- Solving the methodological issues described in various papers. For some of the problems solutions were described by IHIS.
- Planning the bottom-up approach.
- Setting up a database for integration of indicators, its sources and deviations. The methodological metadata information could be integrated here as well.
- Fostering the cooperation between the different institutions and stakeholders, e.g. the liaison office.

- Clarifying roles and responsibilities between stakeholders, e.g. which organisation is providing primary data, which organisation will primarily drive the analysis of data? Which institution is responsible for making policy recommendations?
- How is the interface between the different institutions and their tasks?
- How is data converted to valuable information from the viewpoint of stakeholders?
- Who defines the analytical framework? The SHA Manual[1] proposes a number of basic SHA tables for a country. However, it does not address the issue of how to present the information from these country-specific SHA tables in a comparative way.
- How can the whole working process and the cooperation be standardised, independently from specific people? Setting up a SOP is recommended.

ANNEX I – Summary of mission reports

The following missions have been undertaken during the executive duration of the twinning light project:

Prof. Ulrich Laaser, PL

The first mission of PL took place from May 20 and 21, 2004. The purpose of this mission was to officially introduce the PL the MoH and IHIS. Together with the beneficiaries it was decided to finalise the Hardware tender during the 2nd mission in June 2004 and to employ a STE2 during September 2004 (3rd mission of PL) in order to compensate for the delayed start of the project with regard to harmonisation of health indicators. Harmonized indicators were understood as a set of about 1000 indicators defined according to and compatible with WHO-HFA, OECD, EUROSTAT and SR requirements. Also already during the second mission in June 2004 an attempt should be made to define software requirements. As IHIS is working together with experts from the SO SR and the Ministry of Finances on the OECD "System of Health Accounts" , it was agreed to further develop this area in the limits of the remaining capacities. It was planned to have a specialist (STE3) come to Bratislava in January 2005 (4th mission) who would work on that issue. A preliminary plan of the missions to Bratislava between May 2004 and February/March 2005 was agreed upon (see inception report).

The second mission took place from June 15-23, 2004. In a start-up meeting with the director of IHIS and MoH representatives the programme of work was agreed on. The HW tender was finalised and the framework for the preparation of the SW tender was set. The original scheme foresaw the SW tendering period to take 3 months for the 4th quarter of the year i.e. October-December 2004. This would have left almost no time to establish operationality of the whole system before the pilot study. Therefore it was considered to be unlikely that the pilot study could be realised as planned within the lifetime of the project, also because the CFCU would not be functional in the transition period to another format of EU representation in early autumn. Therefore three modifications of the project time table were necessary:
a) The SW tender had to be prepared already in July 2004
b) The pilot study had to be replaced by an assessment of the functionality of the system according to a set of criteria to be determined between GVG and IHIS/MoH.
c) The project had to be prolonged by one month until the end of March 2005.
The plan of the missions to Bratislava in 2004/05 was adapted accordingly.

The third mission took place from September 6-10, 2004. The PL was introduced together with STE2 to the new director RNDr. Lubomir Vlcak, followed by a meeting with staff of MoH and IHIS in the afternoon. There was consensus that the delayed tendering of the SW would not be compatible with the originally planned pilot study in January 2005. Therefore the decision was confirmed that the pilot would be executed by IHIS after the end of the project i.e. in early summer 2005. Instead an assessment of the SW according to standard criteria (to be provided by Mr. Hecker together with the tendered company) should be performed (see also inception report for the alternative options). Resources becoming free should be added to the work on SHA. It was concluded that harmonisation of health indicators must be restricted to

those provided by IHIS for NCR to SO SR with sufficient meta-data-information ("black" sections). In addition "blue" and possibly "red" sections may be checked. Thirdly, a comparative synopsis of IHIS with NCR, WHO and OECD should be given. Fourth, the economic indicators required for SHA should be checked if capacities allow it. Lastly, the ECHI 2 shortlist may be checked for availability, in close contact with the SO SR. An ACCESS Database for the redefined health indicators was developed (STE1 & 2), running under the name SAD . SAD is an instrument to describe the available indicators in such a way that the programmer of the winning SW company can make use of it for programming the Database.

The fourth mission took place from January 10-14, 2005. A new office in IHIS was installed. Also a new coordinator was introduced by IHIS (MUDr. Mária Chmelová). A delay was stated with regard to issuing of the SW tender as well as with regard to continuing work with the database (developed by STE1 & 2 in September 2004). STE4 therefore decided to contact Mrs. Škublová, MoH with regard to the finalisation of the TWL and discuss the following proposal for TORs of STEs: (Wednesday 12.01. at 17.00 in the MoH), which where confirmed in subsequent meetings with the director IHIS:

1) Verification of the indicators requested for NEWCRONOS (NCR) by EUROSTAT and comparing the definitions between EUROSTAT, WHO-EURO and OECD as far as necessary (meta-data information). Checking of all indicators with specified staff members and feeding the verified information into the ACCESS Database SAD. An Operations Manual for SAD will be developed.
2) The selection of offers on the tender will probably take place after the end of the TWL. In the end the Database should, however, be served and be accessible by various parties involved (SO SR, MoH, MoF, IHIS, PHA SR, SPH), requiring an agreement between MoH and SO SR. A proposal on the future collaboration between MoH, SO SR, IHIS et al. will be drafted in serving and using the database, taking note of the planned new Institute of Health Information.
3) Exploration of economic OECD indicators required for the SHA in close cooperation with SO SR and feeding them into SAD. Writing of a conceptual/strategic overview on SHA to publicise the advantages for SR. Project team will establish and support a communication format between SO SR and IHIS.
4) An extension of the TWL until end of March 2005 is required.

In addition to the activities mentioned above STE4 agreed that STE1 will be available for a short instruction of the MoH and IHIS representatives to prepare them for adequate selection of SW tender applications. He will also be available for giving advice (email, telephone) to the programmer of the winning company after 31.03.05.
January 14, 2005 a meeting took place in the SO SR with PL, ST2, ST4, Deputy Director and Coordinator IHIS, Mr. Baxa and Ms Szücsova from SO SR. An extensive discussion took place with Mr Baxa and Mr. Ondrejka on the roles of their resp. institutes regarding SHA. Mr. Baxa expressed his interest in methods for the estimation of financial parameters. He also underlined that some kind of strategy paper outlining the advantages of SHA indicators would be very useful from his point of view, as the SHA indicator calculation is rather limited to a technical exercise and as the advantages and benefits of the SHA are so far not fully recognised.

The fifth and final mission took place from March 7-15, 2005. It was mainly devoted to the drafting of the final report.

Tilman Hecker, STE1:

Mission 1 of STE1 took place between 16 and 19 June 2004, where several meetings were scheduled regarding the hardware tender and the general execution of the whole project. The HW tender was finalised until the end of June and sent to the IHIS. The ToR of the SW tender were prepared and sent to IHIS in the beginning of July 2004.

Mission 2 took place between 22 and 30 September 2004. The main task in this mission was to systematise the information on indicators as collected by STE2 and to model a SAD which stores this information in a convenient way. Idea of this database was to summarise indicator meta data in a way that can be easily used by the programmers of the SW , which will later support the calculation of health indicators and their transmission to the EU and other international organisations. As there were delays in starting the official tender process for the SW project by the CFCU, there was a chance to slightly revise the ToR, which had been prepared earlier.

The 3rd and 4th mission took place early 2005. During these missions the SAD was adapted to new needs and a manual was written. A backup function was implemented to protect the work from unintentional damages. Furthermore, a review of the data entered so far was carried out and necessary corrections were made. For higher sustainability of the results of the Twining Project a strategy for planning and conducting a pilot study was prepared. This pilot study shall prove that the SW to be programmed by the subsequent project will fulfil the beneficiary's requirements. In the later stages of mission 4 the STE1 contributed to the preparation of the Final Project Report.

Dr. Jürgen Breckenkamp, STE2:

The first mission of STE2 took place in September 2004 (3rd mission of PL). About 850 indicators were prepared by IHIS for international organizations. All these indicators, except for economic indicators, (see SHA) were verified regarding their definitions and discussed with the responsible experts at IHIS. Indicators not comparable with the international definitions or not available (for special years or in principle) were listed and comments/recommendations were given on how to work with them in the future (see activity 1). It was begun with the entry of data into the SAD , which has been programmed by STE1.
The second mission of STE2 took place in January 2005. During this stay further information was entered into the database. All indicators with possible identical definitions/numbers or similar definitions were compared with each other. The results of these extensive comparisons are stated in the database. Additionally STE2 worked together with STE3 on the SHA (see: Helmut Wenzel, STE3). A small provisional database for the SHA-indicators was prepared and information on indicators was entered.
The third mission of STE2 took place from March 14-18, 2005. During this stay the database was checked regarding incorrect functions and a training how to work with the SAD was prepared and accomplished. The latest version of the - now networkable – SAD was installed. An appointment with Mr. Kruzik (WB project: Health information data centre) from Stapro had been arranged on Wednesday, 16

March. Results of the project were reported to Mrs. Skublova (MoH) and Mrs. Krbatova (MoH) on Friday, 18.03.

Helmut Wenzel, STE3:

This first mission partly overlapped with the mission of STE 2. On 26 January 05 STE 2 and STE 3 had a first meeting on the status of the indicator list. In the afternoon a first introductory meeting with Dr Chmelova was arranged. STE 3 gave an overview on the issues that had to be clarified and a meeting with Ing. Cincura was scheduled for the next day.

Meeting with Ing. Stefan Cincura, Mrs. Lenharcikova, Mrs. Konecna and Dr Chmelova. STE 3 gave an overview on methodological topics (approach and perspective of financing). Meeting with Mr. Vlcak, Dr Chmelova and STE 2, discussion of the necessary integration of health accounts indicators. Possible data sources were identified and evaluated with respect to the OECD tables. Review of different reports from Ing. Cincura and Mrs. Brasenova and subsequent meetings for further discussion. Meeting in the SO SR. Discussion on IHIS working papers and the comparable SO SR approach and the suggested database for integrating the information on departures of the different indicators. SO SR representatives suggested that ST3 and ST4 should elaborate a Strategy paper outlining the main advantages and benefits of SHA indicators for Slovak policy makers and key stakeholders in order to explain and promote the concept of SHA among a broader public.

The second mission (08March– 14 March 2005) overlapped with the missions of STE 1, STE2, STE 3 and STE 4. The team worked intensively on the final report according to a preliminary template provided by TL and finalised some remaining issues. STE 3 met with Dr Chmelova and Ing. Cincura to discuss an additional overview on perceived departures between OECD tables and national tables (excel sheet from Ing Cincura). The team met with Dr Baxa SO SR. They led to a full agreement regarding the final steps in the project, especially regarding the contribution to SHA. On 14.03. a concluding discussion with STE 1 and STE 2 was held.

Sabine Horstmann, STE4:

The first mission (10-14 January 2005) was carried out together with PL Laaser and ST2. STE4 met with IHIS staff involved in health indicators and SHA (Dr. Chmelová, Ing. Cincura) and reviewed IHIS work on SHA indicators. It was decided to translate certain papers written by Ing. Cincura. A meeting with Dr. Baxa, SO SR took place to discuss the SO SR activities in the area of SHA and work of the twining light project. During a meeting with the MoH SR the work programme of the project was discussed.

During the second mission (7 -11March 2005) the work on SHA accounts was continued in co-operation with STE3. The SHA approach of the OECD and EC health policy initiatives, in particular the open method of co-ordination, were assessed. Other projects dealing with SHA in the Slovak Republic were reviewed. A strategy paper on SHA and its benefit for health policy making in the Slovak Republic was

drafted and scope and purpose of this paper were discussed with the SO SR. Further meetings with IHIS staff and the MoH SR took place to discuss project outcomes.

ANNEX II – Materials utilized and evaluated

The following relevant documents have been identified and utilised during the project:

- *Institute of Health Information and Statistics: Slovakia contribution to SHA Working Paper "Activities of IHIS 2001-2004 (translation from Slovak). Provided by Dr. Daniela Brasenova, Bratislava, June 10, 2004*
- *Kawiorska, Dorota: SHA-Based Health Accounts in 13 OECD Countries: Country Studies Poland. National Health Accounts 1999. OECD Health Technical Papers Nr. 10*
- *Poullier, JP, P Hernandez, K Kawabata : National Health Accounts : Concepts, Data Sources and Methodology. World Health Organisation2002*
- *European Commission, Directorate C – Public Health & Risk Assessment; World Health Organisation – Office at the European Union: Conclusions, Fourth High Level Meeting between the European Commission and the World Health Organisation. Brussels, 2 July, 2004*
- *Network of Competent Authorities on Health Information: Strategy on European Community Health Indicators (ECHI) = the "Shortlist". Luxembourg, 5-6 July, 2004*
- *Kramers, Pieter (on behalf of the ECHI-team): ECHI, state of play of the "shortlist" for health status indicators. Working Party on Morbidity and Mortality, Luxembourg, 13 October, 2004*
- *Bardehle D, U. Laaser, KP Strohmeier: Health and Social Reporting in Germany. Compatibility as a Prerequisite for the Rational, Efficient and Publicity-Effective Implementation of Health and Social Policy. ZfGesundheitswissenschaften 10/4 (2002), 326-344*
- *Möller, J., U. Laaser, B. Guentert: Evaluation of Health Care Systems, Contributions made by "The WHO World Health Report 2000". ZfGesundheitswissenschaften 10/4 (2002), 316-325*

- *ESPROS: www.unec.org/stats/documents/ces/ac.68/35.e.pdf*
- *OECD: www.oecd.org*
- *ICON: www.icon-statistics.net*
- *EUROSTAT:europa.eu.int/comm/eurosta t*
- *New Cronos : europa.eu.int/newcronos*
- *Statistical Office SR : www.statistics.sk*
- *CIRCA: forum.europa.eu.int*
- *Statistisches Bundesamt, Wiebaden : www.destatis.de und gesundheitsrechensystem@destatis.de*

Serbian Burden of Disease Study ***www.sbds.sr.gov.yu***

Annex III – Experts contacted

In the MoH , Bratislava :

Ing. Martina Kovacova,
Ing. Zuzana Skublova
Ing. Mgr.Iveta Krbatova

In the IHIS, Bratislava:

RNDr. Lubomir Vlcak CSc
Ing. Jan Ondrejka
Ing.Dana Mastenova
MUDr.Maria Chmelova
Ing.Stefan Cincura
Mgr.Maria Konecna
Ing.Renata Lenharcikova
PhDr.Daniela Brasenova
Bcc. Jozef Buda
Ing.Roman Dovicovic
Ing.Jarmila Hajnaliova
Ing.Jana Lesayova

In the SO SR , Bratislava:

Ing. Pavol Baxa
Ing.Alena Szücova
Ing. Jan Fula
Ing. Alexandra Petrasova

Further contacts:

Ms. Silvia Czuczorova, Central Financing and Contracting Unit (CFCU), Bratislava
Dr. Hans Stein, earlier Ministry of Health, Bonn
Lorena von Jonquieres, ICON, Köln
Dr. Dorota Kawiorska, University Cracow
Prof. Dr. Doris Bardehle, Landesinstitut für den öffentlichen Gesundheitsdienst NRW, Bielefeld
Dr. Michael Cordes, Statistisches Bundesamt, Wiesbaden
Dr. Forster, Statistisches Bundesamt, Wiesbaden
Dr. Markus Schneider, BASYS, Augsburg
Prof. Vesna Bjegovic, School of Public Health, Belgrade

ANNEX IV – Health Indicators Review

a) Comparability and availability of indicators

#1 - Comments on blue and red WHO-indicators

991051 Number of new cases of cancer, all sites, total
991051 Number of new cases of cancer, all sites, male
991051 Number of new cases of cancer, all sites, female
045601 Number of all cases of cancer (prevalence), total
045601 Number of all cases of cancer (prevalence), male
045601 Number of all cases of cancer (prevalence), female
991052 Number of new cases of trachea/bronchus/lung cancer, total
991052 Number of new cases of trachea/bronchus/lung cancer, male
991052 Number of new cases of trachea/bronchus/lung cancer, female
105601 New cases of female breast cancer
105401 New cases of cervix uteri cancer
These blue indicators were now defined as black indicators, since the data are available in principle. It should be clarified with the NOI , why an update needs 5 years and when the data of the year 2000 are available.

030201 % of disabled with regular occupation, 15-64 years
This indicator remains a red indicator, because no data are available. It has to be clarified whether to PHA SR has data to fill the indicator for the year 2002 and further years. Alternative this indicator can be evaluated in the health survey, planned for 2006/7.

171010 % of regular smokers, age 15+ years, total
171010 % of regular smokers, age 15+ years, male
171010 % of regular smokers, age 15+ years, female
These indicators remain red indicators since no representative data are available. It is recommended, to insert questions on smoking habits into the questionnaire of the planned health survey 2006/07. It has to be clarified in advance, which information on smoking habits is available from the PHA SR.

275209 Number of midwives (PP)
992779 Number of midwives (FTE)
These blue indicators were now defined as black indicators. Until 2002 different definitions were used. In some years midwives were counted, in some years also other professions. Since 2003 this indicator is available as the definition requires.

365305 Number of midwives graduating in given year
This indicator remains a blue indicator. The reason for the deviation from year to year (50, 150, 50, 150) has to be clarified with the primary data holder.

340102 Total health expenditure as % of gross domestic product (GDP)
992703 Public health expenditure as % of total health expenditure
270102 Total inpatient expenditure as % of total health expenditure
992706 Public inpatient expenditure as % of total inpatient expenditure
992708 Total pharmaceutical expenditure as % of total health expenditure
992709 Public pharmaceutical expenditure as % of total pharmaceutical expenditure
These indicators remain red indicators. The indicators are available in principle in the IHIS for OECD - but mostly the definitions are not comparable.

992741 Total capital invest. expend. on medical facilities as % of total health expend.
992742 Salaries as % of total public health expenditure
These indicators remain red indicators. It is unknown whether these indicators are available (at the SO SR ?).

Comment

As a rule the black indicators base on definitions of WHO. Deviations from these definitions are stated in "country specific definitions/notes". These comments can be found in the WHO-HFA database. Country specific definitions/notes were checked. Due to the facts that data are evaluated/provided/accepted in different forms and that IHIS is not the primary data holder, it is not possible to change country specific differences.

#2 - *Comments on blue and red EUROSTAT indicators*

Physicians licensed to practice NUTS I, NUTS II level

Dentists licensed to practice NUTS I, NUTS II level

Pharmacists licensed to practice NUTS I, NUTS II level
Qualified nursing staff and midwives licensed to practice NUTS I, NUTS II level
These indicators are not available (red indicators). Instead of this other indicators are available for the thematic domain. The available indicators are preferred by EUROSTAT.
The further availability of these (red) indicators should be followed up with low priority.

Nursing auxiliaries altogether – national level
This indicator is not available. There is only qualified nursing staff in SR.

Caring professionals altogether
This indicator includes persons, that have other functions than "caring". Only professionals employed in the public sector are included, not professionals in the private sector. The definition is regulated by MoH and cannot be changed by IHIS.

Physiotherapists altogether
For this indicator a methodological problem exists. It is not collected as defined by EUROSTAT.

Nursing and residential care beds
This indicator is not available. The "agencies for home care" are created within the last years. These agencies have no beds. Personal can be counted in the future. The agencies are subordinated to the Ministry of Social Affairs and Family SR.

Number of day cases, NUTS I and NUTS II level
This indicator is available in future. The software used in the hospitals was not programmed to count "day cases". Software and documentation will be changed.

Operation on the eye
Cataract surgery
The indicators are available next year.

Operations on the cardiovascular system
The indicator was incompletely recorded in the years 1997 to 2002.
Operations on the cardiovascular system
Coronary angioplasty
Coronary artery by pass graft
Cardiac catherisation
The indicators are available in future. Documentation sheets are prepared.

Comment
Most of the information about procedures (ICD-CM) used in hospitals inpatient care are available from hospitals and the four health insurance companies. Experts from MoH should clarify the possibility of a cooperation with the health insurance companies. The most important insurance company is the "public health insurance company". 80 % of the insured population is member of this company. With data of this company the thematic domain of OECD can be completed. The further existing gap can be filled by a cooperation with the other health insurance companies.

#3 - *Comments on blue and red* OECD indicators

Life expectancy
Information is not available completely (for all years). Indicators are calculated at the SO SR and are available at IHIS with a 2 year delay. This blue indicators should be defined as black indicators.

Neonatal mortality
Information for the years 1960 to 1989 is available on paper only. A working up may be an enormous amount of work. Indicator should be defined as black indicators.
Perceived health status

Indicators were provided in 3-year intervals. IHIS has no influence on the procedure. The indicators should be defined as black indicators.

Health expectancy (disability free life expectancy)
For this indicator a methodological problem exists. It is not clear how to calculate the indicator.

Different approaches to calculate quality of life are used. This approaches base on different data sources and methods to weight life expectancy regarding quality of life in particular age groups. In their simplest form weights can be dichotomous (disability yes/no, disability-free life expectancy (DFLE)), they can be measured qualitative as prerequisite to calculate the disability-adjusted life expectancy with a defined number of disability stages or they base on complex continuous measurements as health adjusted life expectancy (HALE).

If a statistics of disabled persons exists, the disability free life expectancy can be calculated with official data. For Germany a good comparability of the results (DLFE) with the complex method of HALE has been found in spite of the fact, that the extent of health impairment and the field of activities in daily living are not considered. To calculate disability free life expectancy the age specific population data and mortality data as well as the particular proportion of disabled persons must be available (Formula can be found in Sullivan 1971). For the other approaches data of (health) surveys are essential.

(Sullivan, D.F. (1971): A Single Index of Mortality and Morbidity. HSMHA Heath Reports, 86 (4), 347.

Dental health

No denominator (number of examined children) exists for previous years. In the meantime the denominator is available, therefore the indicator should defined as black indicator.

AIDS total
AIDS /1 000 000
IHIS gets information about these indicators from the European Center for Epidemiological Monitoring of AIDS. Therefore a registry must exist in Slovakia which can be asked for the data.

Injuries in traffic accidents
The indicator is not followed up by IHIS. Information is available at the Office of Transport.

Self-reported absence from work due to illness
Indicator can not be determined by IHIS. People take a holiday if they are ill. Absence from work due to illness can be recorded by self reports in the frame of a health survey.

Health employment
Until 2000 it was unknown how many hours people work. The validity of the new data (since 2000) is not known and has to be verified.

In-patient beds
Health care facilities can be differentiated regarding short-term and long-term beds. Additional differentiations are not possible. Uncertain quality of indicators.

Acute care hospital staff ratio
This indicator is not treated at IHIS.

Doctors consultations
Dentists consultations
Number of consultations are defined by "entering an ambulance". Counting is problematic. Indicators should remain as blue indicators.

Immunization: Influenza 65+
Data available since 2000. It has to be take into consideration that most of pensioners do not have the money to pay for immunization.

Acute care bed days
Acute care occupancy rate
Acute care turnover rate

Data available in electronically form since 1996. Information for the previous years is available on paper only.

Average length of stay - in-patient care
Average length of stay - acute care
Data available in electronically form since 1996. Information for the previous years is available on paper only.

External causes of mortality
Indicator is available in future.

Total surgical procedures
No data available (see comments on corresponding EUROSTAT indicators).

Surgical procedures by ICD-CM
For this thematic domain only few indicators are available (see comments on corresponding EUROSTAT indicators).

Patients undergoing home-dialysis, total
Patients undergoing home-dialysis, % of total dialyses
Indicators are not available due to the fact that there is no home-dialysis in Slovak Republic.

Pharmaceutical goods
Pharmaceutical goods, % of population
No data available for this indicator at IHIS.

Tobacco consumption
Indicators for the thematic domain "tobacco consumption" are not available (See comments on corresponding WHO indicators [smoking]).

Body Mass Index
Data base of indicators are regional estimates. The variables "height" and "weight" will be available from the planned health survey.

ANNEX V – Implementation of Social Health Accounts in Slovakia

Helmut Wenzel **Bratislava, March 2005**

Content

Introduction

Health care systems all over the world are faced with limited resources. This situation will even worsen in the future due to changes in the population structure, financing problems as a consequence of increasing unemployment and progress in medical technologies with additional needs for budgets.

Whilst some are complaining over the lack of resources, others are challenging the efficiency[7] of health care and its production processes. Unlike in industry the countries don't have an accounting system that allows to combine input and output values in such a way that optimal production can be determined. This gives room for speculation and - depending on the opportunistic view of some stakeholders - to claims that the amount of money spent, can be reduced without having a negative impact on health. There is no possibility to prove it or even to reject it on the basis of data.

Sufficient financing resources are not the only yardstick for evaluating a national health care system. The quality should be measured by a more comprehensive set of different criteria. The WHO states that systems are often charged to be affordable, equitable, accessible, sustainable, of good quality, and perhaps to have many other virtues as well'[8]. Existing - or better - non-existing disparities between regions within a country or between different groups and social classes are important features that describe the quality of a health care system and its underlying policies.

Any analysis of the feasibility of political goals and the extend of achieving them has to:

- Determine the likelihood to reach that goal with a given set of resources.
- Anticipate and identify undesired side effects that might occur due to the goal to be reached and the potential use of available resources. This has to do with the complexity of the system where the action takes place.
- Balance the value of the goal against the undesired side effects, and
- Analyse the costs (opportunity costs) with regard to forgone possibilities to use the resources for other purposes.
- Thus evaluate the relative importance and relevance of the goal with respect to all other personal values.

Evaluations of a health care system can be done from a national and/or international standpoint. Independent from the viewpoint and the motives the assessment with respect to the above mentioned criteria and steps needs data. Without appropriate data no information can be generated. A specifically tailored set of indicators, with unbiased and timely available data and with follow-up possibilities (time series) is a prerequisite for any action in health care and social politics.

One of the most common ways to evaluate the performance is a rather indirect way, a kind of ‚benchmarking', where the income, the expenditures and the medical

[7] Economic efficiency occurs when society is using its scarce resources to produce the highest possible amount of goods and services that consumers most want to buy. Economic efficiency requires both *productive efficiency* and *allocative efficienc*y. Productive efficiency is when firms deliver the highest possible output from given inputs and so produce at lowest unit cost whereas allocative efficiency occurs when firms produce those goods and services most valued by society

[8] See WHO, Why do Health Systems matter, chapter 1

outcome of health care systems are compared across countries, hoping to identify countries with better performances and to learn from them how to manage systems more efficiently.

From a European perspective there is an additional reason for analysing and evaluating health care systems and the use of resources together. Within Europe citizens have the right to equal living conditions in terms of health outcomes, equal access to care and appropriate financing. From the point of view of economic competition the level of taxes and/or contributions is an important factor for the attractiveness of a national economy, too.

Therefore an overview on the situation and on possible needs for action is vital for a modern Europe. In epidemiology it is well understood that the comparison of life expectancy data across countries needs standardisation. In an international system of health accounts we are just at the beginning to understand how different countries and different national accounts can be compared or what has to be done to create information that is seen as relevant for comparisons. The OECD has provided some tables with a recommended set of indicators.

The purpose of the System of Health Accounts

„The SHA proposes an integrated system of comprehensive and internationally comparable accounts and provides a uniform framework of basic accounting rules and a set of standard tables for reporting health expenditure data. Boundaries of the health system are defined in a wider sense by the SHA including long-term nursing care.

It proposes an International Classification for Health Accounts (ICHA) *that covers three dimensions:*
- health care functions (ICHA-HC);
- health care service provider industries (ICHA-HP);
- sources of funding health care (ICHA-HF).

Standard SHA tables cross-classify expenditures under the three basic classifications providing new and deeper analytic possibilities of how services are financed and provided. The SHA allows for the incorporation of further dimensions of health expenditure into national health accounts: for example, regions, age and gender groups, and disease categories, in order to more adequately answer the question of ‚Who gets what, where, and how'?"[9]

What can SHA-based health accounts provide for policy-makers?

- The SHA helps health policy-making by providing internationally comparable information regarding the overall level of spending on health care.
- It allows for a multifaceted analysis of how financial resources in health care systems are raised (by different financing programmes/agents), how these resources are allocated among functions and service providers, as well as - in a more developed stage - it will show how resources are utilised by regional and social groups in the population.

[9] Eva Orosz and David Morgan, SHA-Based National Health Accounts in Thirteen OECD Countries: A Comparative Analysis, August 2004, p. 11

- It provides information about changes in the composition of spending, the factors that drive growth in health spending and how such growth differs across countries.
- It provides a tool to monitor the effects of particular health reform measures over time.
- It enables analysts to monitor changes in health care systems from an economic point of view; to describe the position and main tendencies of health care within the national economy.
- At the current stage of implementation, the available SHA-based health accounts are only able to partly fulfil all of the potential of the SHA as a statistical framework. Its modular structure as a system of accounts, however, allows for a step-wise implementation.

To produce internationally comparable health expenditure data requires consensus on the boundaries of the health system. A key impetus for developing the SHA was that the realisation by experts in member countries of the limited comparability of total health expenditure (and related indicators, such as the ratio of health expenditure to Gross Domestic Product) due to the wide variation in boundary definitions and in the institutional settings of the health systems across countries.

Approaches and decisions for generating the data

To fill in the data several methodological decisions *have to be made. With respect to* financing *two* basic perspectives *on the classification of health care financing are possible:*

- *The classification according to financing agents. Financing agents are the organisations or*

individuals that directly pay for the health care; that is third-party-payment arrangements and direct payments by households.

- *The classification according to primary sources of funding bearing the ultimate burden of financing. In this kind of analysis, intermediary sources of funding (social security funds, private insurance and NPISH) are traced back to their origin.*

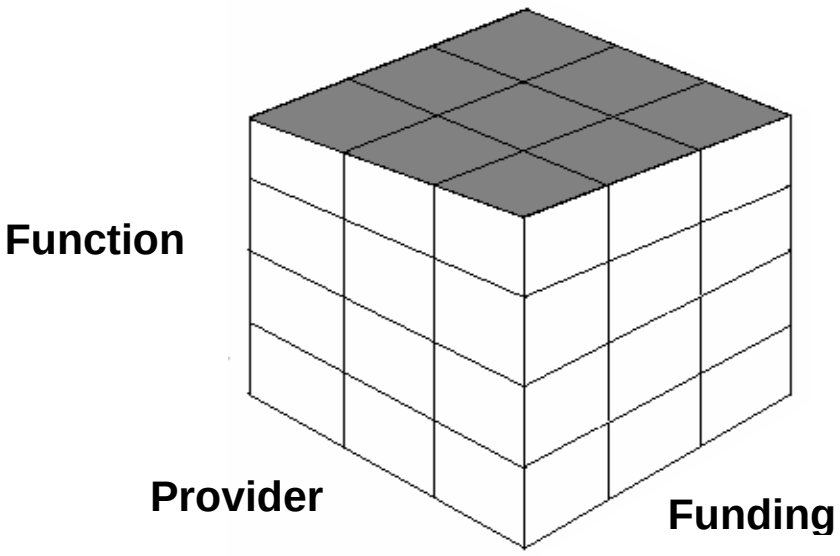

Figure 1: The dimensions of the SHA

The underlying paradigm of the project is the understanding that the role or „function" of the health care system determines the further steps of creating the accounts.

The SHA builds on a consistent *functional approach* in order to define the boundaries of the health system. This approach is "functional" as it refers to the goals and purposes of health care such as disease prevention, health promotion, treatment, rehabilitation and long-term care. The SHA requires the accounting of expenditure spent on these functions regardless whether their providers are considered as health care organisations or institutions outside the health sector in national statistics. This wider definition of the health system includes long-term nursing care services that were traditionally considered as social services in many countries.

Main approaches to building the accounts

HA compilers deal with multiple data sources coming from both sources of funding and providers and with reconciliation all the time. They also tend to use both basic data sources and aggregate information. Nonetheless, a generalisation can be made on the main approaches that HA developers tend to undertake when compiling HA . Three main types of approaches that HA can be distinguished. The first two - the source of funding and the provider approach - are consistent with bottom-up[10] methods, the last one is based on top-down[11] methods.

The source of funding approach

The source of funding approach is used by compilers who use 'sources of funding' data as a starting point and core dataset. As mentioned above, this approach tends to involve the use of expenditure on health by sources of funding as the core figures in the compilation of the accounts. In this approach, it is particularly important to be exhaustive on the source of funding side since the benchmark figure for total health expenditure will be given by total amount of money spent by financing agents (or by primary sources of funding). Hence, as a first step the HA compiler should make sure that all expenditure by all sources of funding appears in the database. From the financial / budgetary information, the accountant then tries to identify the functional breakdown of the activities which are financed and identifies to whom the money has been paid. Reconciliation is then performed, where possible, and provider data sources are checked. This will provide the HA compiler with more information on activities (and thus a better functional breakdown) and will give the opportunity to match expenditures more precisely with the relevant providers. This is the general idea although there are many in-between steps that will be explained more clearly in the five step procedure we propose.

When using this approach, care should be taken not to include non-health expenditure borne by the source of funding (e.g. expenditure on social care or

[10] A ***bottom-up approach*** is used when most of the HA information is obtained using detailed information, possibly presenting activity information at a detailed level. Here aggregate data is used less frequently and reconciliation is often carried out. Pre-existing information is still used but the HA developer does not attempt to migrate directly from one system of recording to SHA data.

[11] A ***top-down approach*** is used when most of the HA information is obtained taking figures directly from pre-existing aggregate health expenditure classifications and recording systems. This usually involves an extensive use of proxies, assumptions and other estimation techniques for breaking down pre-existing aggregates and also involves a limited amount of reconciliation. *A typical example of this is when HA developers attempt to migrate directly from National Accounts to HA .*

environmental health). A typical problem that is faced when following this approach is double counting.

The provider approach

The provider approach is used by compilers who use as their core dataset 'provider based data'. Expenditure on health care when derived from this approach will mainly be based on information on the financial receipts of providers. When this type of information is not available or is not complete, estimation of receipts can be obtained by using information on inputs and their cost (staff wages and intermediate consumption) and output / activity information (number of activities performed and respective prices / costs). In this approach, exhaustiveness will be particularly important on the provider side since the benchmark figure for total health expenditure will generally be given by the total amount of money received by health care providers for health care activities. The general process followed is: The HA compiler usually organises the database by providers of health care. Provider data is the starting point and provider receipts are obtained either directly or using input and output information. From these data a provisional functional breakdown is made and relevant sources of funding from which the money was received are traced. Finally, reconciliation with source of funding and other information is made.

SHA Guidelines *strongly recommend the HA compiler to use a bottom-up approach since the full value of HA is realised only in this way. If one migrates from an aggregate system of recording like the ESA or the SNA (not specifically designed for health care) to the SHA, important boundary issues may be overlooked, the functional classification may be flawed, important pieces of expenditure may be missed out and the objectives of HA production may not be achieved.*

The top-down approach

A ***top-down approach*** is used when most of the HA information is obtained taking figures directly from pre-existing aggregate health expenditure classifications and recording systems. A number of National Accounts classifications present a functional view on expenditure, identifying expenditure on health amongst other functions.

Recommended steps for a top-down approach

Using a top-down approach the following steps are recommended:

4) Understanding the health care system under study
5) Investigating data sources
6) Creating a HA database
7) Resolving issues
8) Filling the tables

Step 1: Understanding the health care system

Before starting with data collection and calculation methods, it is worthwhile dedicating some time to understand how the health care system under consideration functions. Having an overall view of the system might take some time initially but will save lots of time and avoid misunderstandings in the future. There are two key parts

to this process: Comparing the national and SHA health care boundaries and a sketch of the health care system.

Comparing the national and SHA health care boundaries
The SHA definition of the health care boundary is different from definitions used in national systems of accounting and it is crucial to pin down all the points of divergence between the systems. The main difference is that the System of National accounts (SNA) puts all domestic production within the boundary whilst the SHA puts all domestic consumption within the boundary. The other key difference is the inclusion in the SHA of items such as household production of health care services.

Experience in different countries shows that adopting SHA definitions can change estimates of total health expenditure substantially, in some cases in the order of one percent of GDP or more. All countries have existing, perhaps non-SHA based, estimates of health care expenditure and may use various classifications to break it down. In all EU countries, the majority of health care expenditure is financed publicly, in varying proportions of tax finance and social security funds depending on the country.

For this reason, the Ministry of Health or Social Security Fund authorities are a first point of contact. The working definition of what is considered to be health at a national level is likely to vary from system to system due to different institutional arrangements, payment systems and country traditions. Getting hold of the concepts and classifications existing nationally is the first step in HA compilation. These should then be compared to SHA definitions, with the aim of identifying the key differences in the definition of the health care boundary. Some countries also possess National Health Accounts (pre-SHA) which attempt to describe the health care system in a detailed and complete way. In this case, this information should also be compared with the SHA.

Step 2: Investigating data sources
This step involves identifying and investigating datasets that contain information on health care. It also involves making an inventory of these sources and recording their main characteristics. This stage should also see the beginning of an exhaustive list of actors in the health care system, based on the information taken from the data sources studied.

Making an inventory of data sources
The first thing to do is to catalogue known sources of data on health care, especially those sources which include expenditure or other financial information such as costs or prices. The contacts listed in Annex 4 will be an excellent group of people to assist in identifying such sources.

In all countries, there are bodies of work that can be drawn on when developing HA and it is therefore not the case that development work has to start from scratch. The HA developer should draw from pre-existing systems, making sure that the more detailed, original data sources used by them are identified wherever possible. In summary, these include the National Accounts, any non-SHA HA , government records (for example, Ministry of Health budgetary information, regional government's data) and Social Security data. These should then be complemented with other data sources such as data from insurance umbrella organisations and NPISH accounts

data, for example, where these are not included in the databases mentioned above or where more detail is necessary.

When making the inventory, each source should be examined with the aim of finding out what the main content is, what information is provided, what questions are answered and what the original purpose of the source is. The aim here is to record all relevant metadata that will be of use when dealing with data for SHA compilation. Sources could be divided into two main categories: source of funding data sources and provider data sources.

Step 3: Creating a HA database
After completing the inventory and having had a first go at recording actors, data should start to be collected and recorded in a database through the use of appropriate software packages.

We identify five parts to this process:
1. Which data to acquire
2. Placing existing data as they are into a spreadsheet or database package
3. Initial allocation to SHA classifications
4. Further investigation of data sources
5. First SHA tables

An iterative approach is recommended for this work. Of course, information on new actors as they are discovered should be included in the list of actors and the health care sketches should be cross-checked and updated on the same ongoing basis.

Which data to acquire?
There is no doubt: the more data the better. However, it should be acknowledged that there are costs associated with the acquisition of data. Some datasets will not be free of direct costs and a fee may need to be paid. Such a fee may be substantial as is common for market research data. For other datasets, the burden on providers in tailoring the dataset, or the time and other resources required of the team in acquiring the data should be considered. Of particular importance in the early stages of development will be to focus on the acquisition of data on expenditure. Other, non-expenditure, datasets can be acquired at a later date when a view has been taken on the extent to which expenditure sources are sufficient.

Placing existing data into a spreadsheet or database package
Depending on the approach chosen, the data recorded at the start will be related to sources of funding or to providers. At this stage, the recording will consist of simply placing the figures taken from the relevant data sources into a spreadsheet or a database package. The organisation of the database should be constructed bearing in mind the nature of the health system and the availability of information. In the UK, the main data sources are from sources of finance, and so the suite of spreadsheets has been designed with this in mind. In the Netherlands, a provider approach has been taken, where a sheet exists for each provider, or actor.
Initial allocation to SHA classifications
This corresponds to a first attempt at allocating the functional, source of finance and provider classifications. Of course, at an early stage of development, any allocations should be on a pilot basis but can be used as a benchmark for future development. It

is also worthwhile designing the system to cope with a great deal of information from an early stage on. This will allow issues to be more readily resolved at a later date.

Step 4: Resolving issues

The importance of keeping a record of issues relating to data sources was highlighted in previous subsections. However, these issues related only to individual data sources. An examination of the first SHA tables will have highlighted issues involving more than one data source: for example, different data sources might suggest different values associated with the same activity. This step discusses how to resolve the issues relating to both individual data sources and those relating to the comparison of multiple data sources for the same activity. First of all, this subsection lists the typical issues that will be encountered.

Typical issues encountered

- *No data on an actor:* this issue arises when there are no data on actors that are known to bear expenditure on health care. For example, there may be no information on health expenditure in prisons and in armed forces, or in institutions for the elderly or the disabled which perform health care activities as well as social care.
- *Insufficient functional information:* for example, data for some institutions that provide joined-up care (health and social care provided as a single service), a separation of health and social care might not be readily available. It might also not be possible to distinguish detailed SHA functions within the overall health care boundary.
- *Lack of cross-classification:* this issue arises when an individual data source does not provide information on the cross-classification by function, provider and source of financing. For example, household budget surveys typically collect information on the goods and services bought (from which the function can be derived) but may not capture sufficient information on the provider.
- *Limitations from individual data source*s: this covers a wealth of issues. Included are, for example, incomplete population coverage with household budget surveys tending to cover only people living in private households and not those in communal establishments. Sample surveys are subject to sampling error and certain data collection instruments do not record expenditure on certain goods and services well e.g. surveys of individuals are known to under record purchase of medical goods and services of a particularly personal nature. See subsection 5.1 for further examples of these limitations.
- *Contradictory result*s: multiple data sources may provide different information on the same activity. This may be due to the different views taken by the different sources, from the source of funding and provider sides, but also because of the different purpose of collection or sampling error.
- *Lack of information on expenditur*e: in some cases, there may be no information on expenditure, although there might be information on activities for instance.
- The specific guidelines in section 2 present advice on how to deal with these issues in relation to the individual functions and other areas for which countries have reported compilation difficulties. The remainder of this subsection gives advice from a general perspective on how these issues can be resolved, grouping the solutions into three main categories:
- Acquiring more information
- Making assumptions and the use of keys
- Collecting new data
- A fourth type of solution, reconciliation of contradictory results, is dealt with separately in chapter.

Making assumptions and the use of keys

Even after searching for other data sources, in some cases there will still not be sufficient information in order to comprehensively estimate a component of the HA and it will be necessary to resort to other estimation means using other information available. This will clearly be the case where there is no expenditure information available for a HA component, but this may also be the case where the expenditure information available is limited.

Using keys and keying refers to the practice of using the distribution of a proxy variable as a substitute for an actual distribution. For example, where no information on the distribution of expenditure across functions for a particular actor is concerned, that distribution of activities might be used as the "key" for allocating the functional distribution.

Taking the scenario of a social security fund for which we want to find out administrative expenditures on health, if what is known is only how much the fund pays out for health goods and services and for social care but not how much administrative expenditure is related to these, it might be necessary to make an assumption. For example, it might be reasonable to assume that the ratio of expenditure on health goods and services to social care is the same as the ratio of their respective administration costs. For example, if 8% of the fund pays for health goods and services and 92% pays for social care, 8% of total administrative costs would be allocated to health care expenditure. Such an assumption may need to be tested, possibly by enquiring further into the cost structure of the funds administration. Whether or not it is possible to test such an assumption, the known limitations of the assumption should be fully documented. There are other assumptions that can be used. The important points are that they should be justified and well documented. All estimation methods and assumptions should be clearly presented in metadata attached to the final results. This transparency is a key part of Health Accounts development as it provides users with a better understanding, and of course assists compilers in subsequent compilation rounds.

Step 5: Filling the tables

Once the database is complete, meaning there has been a final iteration of the compilation process, gaps have been filled and issues have been resolved as far as is reasonably possible, it is important to carry out an audit of the compilation process to ensure that the HA are of high quality in terms of calculation, spreadsheet manipulation, importing and exporting of data, and provision of metadata for the user to understand fully the process.

An important issue to be kept in mind is metadata information as an aid to compilers in subsequent

HA development and compilation rounds. It is important to present next to the tables descriptive information which explains the methods used in order to obtain the figures. In particular, it should be pointed out which parts of the table are of particular concern regarding quality, and the what is the nature of this concern. Credibility is enhanced through the honest description of issues and problems. It also promotes the improvement of information as data suppliers begin to understand how their information is used and to strive to make improvements.

The output of the process is the cross-classification of total current expenditure by function, provider and source of financing, which corresponds to the SHA's set of proposed standard tables.

The approach chosen in Slovakia

The most preferable approach is bottom-up and function oriented. Nevertheless, the choice of the approach will generally be dictated by the type of sources that are available, which in turn is usually determined by the type of health care system in place, and the type of pre-existing accounting framework.

For practical reasons the Slovak organisations involved in the project chose a two options strategy. They started with a top-down approach, which is function oriented and financing agent based with the plan to switch to a bottom-up approach as soon as possible.

The working process followed the recommended steps mentioned above (see **for a top-down approach**). Based on a suggested flowchart of payments in the Slovak heath care system data sources were identified and evaluated to be used as a basis for the OECD tables. This step resulted in an overview of indicators and data sources classified according to availability and departures.

The results of the working process up to now

1. The IHIS aimed at collecting and classifying data according to the three dimensions for health expenditures, namely by functions, financing units and providers. IHIS described major tasks of the development of the NHA , i.e. (basic principles, terms, classifications and rules for accounting) and to develop conceptual framework of the NHA adaptation of concept seems to be a demanding task . It has to be stressed here that such an adaptation is not a routine task carried out mechanically. It needs careful comparison and harmonisation.[12] *For reasons of complexity due to the combination of indicators, the information on departures or congruence, a database would be a helpful tool.*

2. Summary information and outstanding issues [13],[14]

- As result the type of health care in the system of health accounts is understood in a broader and more differentiated way, now.

The personal health care is subdivided, **according to the function** it performs, into the health care: therapeutic (curative), rehabilitation and long-term nursing. Each function of the personal health care is simultaneously classified **according to the way** it is provided, i.e.: inpatient (beds), day, outpatient, home.

- Such a complicated classification represents a substantial source for inconsistency compared to our taxonomy, because the terms such as e.g. outpatient or inpatient (beds) care have a different content, or they are differently defined their specification, for example, the border lines of outpatient care are different than in our statistics. The same notion does not necessarily mean the same definition and the same concept of the indicator.

[12] Brasenova, Institute of Health Information and Statistics Department of Information and Publication Services, SLOVAKIA Contribution to SHA Working Paper, Activities of IHIS since 2001 – 2004, June 10, 2004

[13] Cincura, IHIS, Summary information and outstanding issues, IHIS , SHA , Bratislava, June 2004

[14] Brasenova, ibid.

- The structure according to the type of health care does not correspond to the classification that is still being used in our country. The system of health accounts understands the function (type) of health care and health care provider as two totally independent dimensions, whereas within our statistics these dimensions overlap. In our country the personal health care is not thoroughly classified according to the way of payments (expenditure) for bed, outpatient and long-term nursing care. This significant difference represents a major problem when utilizing our statistics for the SHA . It does not facilitate to generate relevant indicators by the so called “filling in from the top”.

- Another problem represents the classification of personal health care (both outpatient and inpatient) according to the function. Our statistics just monitor the health care as a whole, and the main understanding of it is medical (therapeutic) care, from of which rehabilitation and long-term nursing care are not separated.

- The given anticipation methodology for computation of gross capital formation will have to be further elaborated, specified, described in detail and justified. In some respects it is based on the economic instinct and discoursed knowledge rather than on strict accounting. A provident, simple, clear and understandable computation method, even though with a certain portion of generalization should always be favoured. In turn, the same should apply to the whole system of health accounts, provided it serves those objectives for which it is developed. In fact, reality is much different from all those, even the most sophisticated methods.[15]

[15] Štefan Činčura, Analysis of the current approaches to determination of the capital formation in the health care provider institutions and draft methodology of its computation**,** Bratislava, November 2004

Overview on indicators[16]

Part 4	At all?	1990 +/-	1999-2001	2002
Total expenditure on health	■	□	■	■
Public expenditure on health	■	□	■	■
Private expenditure on health	■	□	■	■
Total current expenditure on health	■	□	■	■
Public current expenditure on health	■	□	■	■
Private current expenditure on health	■	□	■	■
Total investment on medical facilities	■	□	■	■
Public investment on medical facilities	■	□	■	■
Private investment on medical facilities	□	□	□	□
Expenditure on health R&D	□	□	□	□
Total expenditure on prevention and public health	■	□	■	■
Total expenditure on curative and rehabilitative care	□	□	□	□
Total expenditure on long-term nursing care	□	□	□	□
Total expenditure on in-patient care	■	□	■	■
Public expenditure on in-patient care	■	□	■	■
Private expenditure on in-patient care	□	□	□	□
Total expenditure on curative and rehabilitative in-patient care	□	□	□	□
Total expenditure on long-term nursing in-patient care	□	□	□	□
Total expenditure on out-patient care	■	□	■	■
Public expenditure on out-patient care	■	□	■	■
Private expenditure on out-patient care	□	□	□	□
Total expenditure on pharmaceuticals and other medical non-durables	■	□	■	■
Public expenditure on pharmaceuticals and other medical non-durables	■	□	■	■
Private expenditure on pharmaceuticals and other medical non-durables	■	□	■	■
Total expenditure on hospitals' services	■	□	■	■
Total expenditure on services of nursing and residential care facilities	□	□	□	□
Total expenditure on services of ambulatory health care providers	■	□	■	□
Part 5				
Health expenditure by general government, excluding social security	■	□	■	■
Health expenditure by social security schemes	■	□	■	■
Out-of-pocket payments (households)	■	□	■	■
Health expenditure by private insurance	■	□	□	□
All other private expenditure	□	□	□	□
Percentage of core variables	69%	0%	66%	63%
Percentage of minimum dataset variables	88%	0%	88%	83%

■ Data available
□ Data not available

Conclusion and final Recommendation

- *There is a trade-off between the amount of time allocated to compilation and other aspects of quality, such as comprehensiveness, validity and credibility. Of course, there is a point at which a dataset is considered too poor to be included as part of the compilation process. However, it is clear from all previous experience that no data source is perfect. The compilation of HA is an ongoing process, involving a continuous development cycle. In the planning phase, it is very important to be informed about the initial desired quality of the accounts, since this will have an important effect on the resources required by the project.*
- The accounts should be built up from detailed data sources, the so-called,bottom-up approach, but in the first development round(s) some components may be typically estimated using top-down approaches, whereby existing health expenditure aggregates are broken down according to the availability of proxies and other estimation techniques.
- Over time, as HA are redeveloped, compilers should aim to replace top-down with bottom-up methods.

[16] For Official Use DELSA/ELSA/WP1/HS(2004)8, HEALTH EXPENDITURE AND FINANCING (PARTS 4 & 5) IN OECD HEALTH DATA 2005, 20-Sep-2004, p. 37, document 33833553.pdf

- An important issue to be kept in mind is metadata information as an aid to compilers in subsequent HA development and compilation rounds. It is important to present next to the tables descriptive information which explain the methods which were used in order to obtain the figures. In particular, it should be pointed out which parts of the table are of particular concern regarding quality, and the nature of this concern. Credibility is enhanced through the honest description of issues and problems. It also promotes the improvement of information as data suppliers begin to understand how their information is used and to strive to make improvements.
- *The setting up of a team with dedicated staff rather than ad-hoc project workers is also a key part of institutionalisation. Metadata should be attached to the tables and indicators, to make sure that the correct understanding of the indicators is independent from personnel and valid over time.*

Further tasks

- Solving the methodological issues described in various papers. For some of the problems solutions were described.
- Planing the bottom-up approach
- Setting up a database for integration of indicators, its sources and deviations. Here the methodological metadata information could be integrated as well
- Fostering the cooperation between the different institutions and stakeholders, e.g. liaison office.
- Clarifying roles and responsibilities between stakeholders, e.g. which organisation is providing primary data, which organisation will primarily drive the analysis of data? Which institution is responsible for making policy recommendations?
- How is the interface between the different institutions and their tasks?
- How is data converted to actionable information from the viewpoint of stakeholders?
- Who defines the analytical framework? The SHA Manual proposes a number of basic SHA tables for a country. However, it does not address the issue of how to present the information from these country-specific SHA tables in a comparative way.
- How can the whole working process and the cooperation be standardised, independently from specific people? Setting up a SOP is recommended.

Enclosures

- Brasenova, Institute of Health Information and Statistics Department of Information and Publication Services, SLOVAKIA Contribution to SHA Working Paper, Activities of IHIS since 2001 – 2004, June 10, 2004

- Štefan Činčura, IHIS , Summary information and outstanding issues, IHIS , SHA , Bratislava, June 2004

- *Štefan Činčura, Analysis of the current approaches to determination of the capital formation in the health care provider institutions and draft methodology of its computation, Bratislava, November 2004*

- *Štefan Činčura, Medodicke rozdiely-pre, March 2005*

Glossary of Acronyms

Acronym	Description
CFCU	Central Financing and Contracting Unit
EU	European Union
FPH	Faculty of the Public Health at the Trnava University
HI	Health insurances
IHIS	Institute of Health Information and Statistics
LC	Liaison Committee
MoF	Ministry of Finance of Slovak Republic
MoH	Ministry of Health of Slovak Republic
MS	Member State
NB	National bank
NLI	National Labour Inspectorate
NOI	National Oncological Institute
PL	Project Leader
PHA SR	Public Health Authority of the Slovak Republic
SAD	Small Auxiliary Database
SHA	System of Health Accounts
SOP	Standardised operating procedure
SO SR	Statistical Office of the Slovak Republic
STE	Short Time Expert
SW	Software
TL	Team leader
ToR	Terms of Reference
TWL	Twinning Light
WB	World Bank
WHO	World Health Organisation