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FINAL REPORT ON THE PHARE
HEALTH SECTOR MANAGEMENT
PROJECT 1992/1993

EDUCATIONAL PROGRAMME REPORT 2

Developing management information systems Programme design and participants in the IESE national seminars (December 1992; January 1993) and study visits (March 1993)

INTRODUCTION

As part of the PHARE health sector management project, the management information systems experts in the project team, Professor Toni Garcia and Professor Jaume Ribera (both from the Instituto de Estudios Superiores de la Empresa, Barcelona) led national health management information system seminars in each Republic and organised visits for twelve Czech and Slovak management and information systems experts to study aspects of the Catalan health system.

This paper reports on the design of these two seminars and describes issues of interest to participants in the Barcelona study visits.

CONTENTS

HEALTH MANAGEMENT INFORMATION SYSTEMS SEMINAR - STUPAVA - December 14th and 15th, 1992

I. PARTICIPANTS

- Ministry of Health
  MUDr. Rupcikova. Head of Epidemiology Department

- Health Insurance Company
  Dr. Karovic. Deputy Director

- Research Institute for Medical Informatics
  Dr. Rusnak. Deputy Director
  Dr. Pivacek

- Institute of Health Information and Statistics (UZIS)
  Dr. Ondrejka. Director
  Ing. Uvacek
  Ing. Svitkova
  Doc. Volna

- National Institute of Hygiene and Epidemiology
  MUDr. Krizanova
  Ing. Nemeth

- ILF
  Dr. Schwarzova
  Ing. Krnac

- Institute of Hygiene and Epidemiology. Trencin
  Dr. Holla

- Trencin Hospital
  Dr. Gularova
  Dr. Obeda
  Dr. Polekova
  Dr. Simurka
  Ms. Vaculikova

- Health Insurance Agency. Trencin
  Dr. Paliatka

- Institute of Medical Cosmetics
  Dr. Haid

- Institute of Hygiene and Epidemiology. Rimavska Sobota
  Dr. Beres

- PHARE Project Adminstrator
  Mgr. Stricova

- PHARE Project Team
  Prof. Garcia
  Prof. Ribera
  Dr. Mitchell

II. OBJECTIVES

The main objectives of this seminar were the following:

- To familiarize participants with a methodology to solve information systems (MIS) problems from a managerial perspective, i.e. related to the mission and the vision of the institution.

- To clarify the stages of MIS analysis required before a hardware decision needs (or can) be made.

- To provoke inter-sectoral/inter-institutional discussion in a non-threatening environment.

III. PROGRAMME

First session: SASA. This case is an introductory case presenting the situation of an auction company in Madrid. The participant is asked to define the critical success factors (CSF) of the company and to develop an analysis of the information system needed to help achieve them.

a) Define business. Identify stake-holders.

b) What is the mission of the business. Development of performance indicators to evaluate the success

c) Definition of the Critical Success Factors (CSF).

d) Basic Idea on how Information Technologies can help improve performance on CSFs.

e) Define existing Business Activity Sequences (BAS) of the business.

f) Critique and improvement of the BAS. Concept of added value/cost.

g) Information needed in each step of the BAS.
   - Operational vs. Supporting activities

- Information process sequences vs. Decision intervals
- Level of knowledge about the process
  * Observable - Evaluate
  * Controllable - Factors to influence
  * Improvable / Optimizable

h) Specify Information System Procedures
- Data flow diagrams: output and input definition
- Data dictionaries
- Entity - relationship models
- Data processing descriptions
- Data base design

Second session: Nemocnice Svate Klary (case study)

Previous methodology applied to a hospital with three different businesses (social security, private insurance and private patients) facing changes in the environment and organizational problems.

Third session: The Spanish system: structural and information systems evolution

Fourth Session: Mapping missions, CSF and information requirements in the Slovak Health System

IV. COMMENTS ON THE EVOLUTION OF THE SEMINAR

a) This was the first seminar to be offered in-country (following the London educational programme, November 1992) and we did not do a good job of communicating the objectives, thus resulting in a group with mixed expectations and non-homogeneous level of knowledge on MIS.

b) The methodological approach presented in a theoretical way on the first day did not match the expectations of most participants, specially those that had not attended the London programme nor had had any previous contact with the Project. Participants seemed to be looking for "quick informatic solutions" tied to their particular tasks in the present. Furthermore, the proposed case

discussion method was new to many of the participants who were more used to sit and listen to proposed solutions.

This situation was somehow frustrating both for participants and leaders. Despite this, a decision was made by the project team to proceed with the original program.

c) On the second day of the seminar, participants were asked, as planned, to identify missions of the different stake-holders present in the Slovak health system. Thus, ministry, insurance company, district authorities and providers were to define their reason for existence and also their most critical functions and objectives. Once this process was accomplished, information requirements and interrelations had to be mapped.

It was difficult for some participants to produce clear views on their agencies' contributions when considering the real nature of their current jobs. Probably because of this, some participants left the seminar at the time these issues were to be discussed.

d) In the last part of the seminar, where participants had to discuss with other stake-holders the interrelations in terms of information, it appeared that:

- no provision was made from central administrative levels to provide information to lower level providers of health care

- some discussions started in such a way that some participants were trying to look for a way of justifying the information they are now collecting, thus revealing a clear sense of feeling threatened by the recent and coming events

- some participants reported being approached by others who, in the past, had been reluctant or even had refused to cooperate or share information; these old behaviours seem to be being replaced by a more "cooperative-we need to sit down and talk" approach. (Can this be one of the measures of success of this seminar?)

HEALTH MANAGEMENT INFORMATION SYSTEMS SEMINAR - ZVIKOV - JANUARY 21ST AND 22ND, 1993

I. PARTICIPANTS

- FN Hradec Kralove Dr. Milan Elbl
- Batlova nemocnice Zlin Dr. Prehnal p. Lumobir Machovec
- Stredisko aplikovane kybernetiky Benesov Ing. Jan Martinek
- UZIS Mgr. Jiri Holub Mgr. Zuzana Kamberska
- NsP Kladno MUDr. Alice Baumannova
- nemocnice Pardubice Ing. Radim Petras
- FN Olomouc MUDr. Jiri Petr
- nemocnice Pisek Dr. Pumpr Ing. Janovsky
- nemocnice Bulovka Ing. Frantisek Novak
- Fakultni nemocnice Praha 2 Ing. Cestmir Holy
- vyp. stredisko Hradec Kralove Ing. Milan Svoboda
- nemocnice usti nad Laben Dr. Pavel Zubina
- prednosta klinicke hematologie Olomouc Doc. Jindrak, CSc.
- FNI Ing. Sedlak
- nemocnice Trebic Dr. Jan Lhotsky
- NsP Pribram Ing. Jaroslav Kaluz
- nemoncnice Vsetin Ing. Martin
- vypocetni stredisko Praha 9 Ing. Karel Vavra
- ministerstvo zdravotnictvi CR RnDr. Karel Neuwirt Dr. Martin Malinak
- Special guest/interpreter Frantisek Osanec
- Interpreter Zdenek Krpal
- PHARE Project Team Prof. Ribera Prof. Garcia

II. OBJECTIVES

- To familiarize participants with a methodology to solve information systems problems from a managerial perspective, i.e. related to the mission and the vision of the institution.

- To clarify the stages of MIS analysis required before a hardware decision needs (or can) be made.

- To provoke inter-sectoral/inter-institutional discussion in a non-threatening environment

III. PROGRAMME

The program was slightly modified after the previous experience of teaching it at Stupava. However, the objectives remained the same.

Introduction (before lunch first day, since we started very late)

Brief introduction of the professors and the participants. Distribution of name tags. Asked to find similarities with the jobs of other participants in order to create a team later on.

Presentation of the program. Explained why we will use cases and that we will be very flexible with the timetable, adjusting it as we move along.

Presentation of three working schemes for management information systems:

(1) Operations diagram on three levels: (a) operative, (b) decision-making, (c) policy-making and resource-allocation. Data/Information flow among them.

(2) Diagram on systems, structure and people.

(3) Management control systems cycle: Plan, Do, Check, Act.

First session (immediately after lunch) Your job

The participants were asked to take a piece of paper and answer the following questions:

(1) A description of the task of the department they are working in.

(2) Why does this department exist? What is its purpose? Its objectives?

(3) Define a set of measures to evaluate the department. I.e. if you go on leave of absence for a year and when you return your successor tells you the things are now much better/worse, how would you evaluate the truth of the statement.

(4) What is the information that you get now that is useful to your job (refer also to question 3)

(5) What is the information that you do not get yet but that would be very useful to your job.

(6) What information do you provide to others. How do they use it?

After their individual answers, small teams met to agree ideas in common. Finally each group made a presentation and the rest questioned some of the points they made.

We concluded with a few comments on the presentations: the importance of measuring results, the easiness of defining success by looking at inputs and process, and the necessity of focusing on actual results achieved by the internal/external customers. Several examples provided by the participants included: (a) input: (equipment available, number of beds, number of surgeons, etc), (b) process (number of procedures performed, length of stay, etc), and (c) outcomes (deliveries, number of iatrogenic infections, etc).

One of the groups came up with a measure of success of the information system department: intensity of use of its work. This provoked an interesting discussion.

Second session (second half of the afternoon and the after-dinner session): SASA (case study on auction company, already described in the Stupava seminar summary)

The SASA session continued over in the morning of the second day. It was concluded with a little lecturette on: Customer satisfaction as a measure (first law of services) and the difficulty of evaluation (scale of Zeithalm).

Third session (morning of the second day): Nemocnice Svate Klary (case study)

Previous methodology applied to a hospital with three different businesses (social security, private insurance and private patients) facing changes in the environment and organizational problems.

The alternative-criteria matrix. How to use nominal voting techniques to achieve a "consensus" agreement.

Fourth session: This was intended as a final open discussion session, but we ended up answering questions about the Catalan and Spanish system, which proved quite interesting to the participants.

IV. COMMENTS ON THE EVOLUTION OF THE SEMINAR

a) This seminar was similar to the one already offered in Stupava, but much of what we learned there was applied here: we were very keen to shape the expectations of the participants and also to provide more directed discussion. These changes seemed to improve the participants' perception of the usefulness of the seminar.

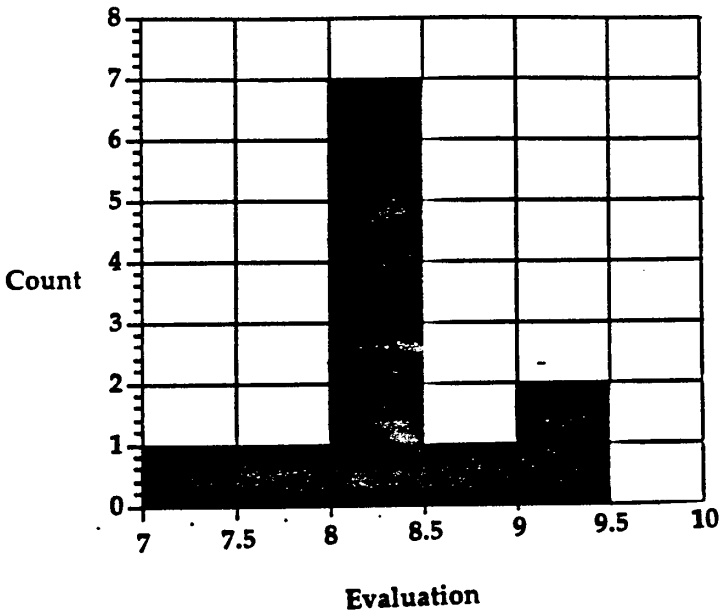
b) The seminar was considered quite successful with encouraging comments from some of the participants. This was quite satisfactory given the initial expectations, the Stupava experience and the fact that only Dr. Pumpr was known to us (in addition to the people from UZIS and Dr. Neuwirt).

c) The group was very good with highly motivated people who worked on the cases very well. When separated in small teams they grouped in three teams: central people, directors-managers-administrators, and people in charge of information systems. The second group had some difficulties in focusing their efforts, but after a while they also got good results.

d) During the seminar there appeared some small tension between the managers group and the central group.

e) At the end of the seminar, we asked the participants five questions, including:

- Evaluate the usefulness of this seminar on a scale of 0-10



- If we were to do this seminar again, would you advise your colleagues to attend? Everybody answered positively.

STUDY VISIT - BARCELONA
1ST GROUP : 15TH TO 19TH MARCH
2ND GROUP : 22ND TO 26TH MARCH

Participants

1st. Group	2nd. Group
Marian Obeda	Maria Alexandrova
Branislav Koren	Marian Hojsik
Petr Pumpr	Pavel Brezovsky
Vlastimir Fibich	Karel Neuwirt
Zuzana Kamberska	Ludmila Subertova
Rudolf Pechlat	Miroslav Jiranek

OBJECTIVE

As an additional element to the consulting and teaching activities performed in the Management Information Systems area, a study trip for managers, planners and information systems experts was planned

The main objective was to expose Czech and Slovak professionals to:

- a different health system, characterized by a clear separation between financing and provision, with a multiplicity of public and private agents, cooperating and also competing;

- its main organizational, financial and planning challenges;

- a wide sample of information systems, covering very different elements of a health system.

Participants were offered an intensive program, combining introductory and concluding sessions with selected site-visits and meetings with Catalan managers and experts in their work-places.

Beyond these objectives, participants could also explore and get acquainted with Western attitudes toward authority, competitors and information. There was also the possibility of discussing common management challenges.

Personal contacts may become the basis of future cooperation and sources of mutual technical support, common projects and sharing of experiences.

CONTENT

1. REGIONAL MINISTRY OF HEALTH. GOVERNMENT OF CATALONIA

(i) **Catalan Institute of Health, Information Systems Unit (ISU)**: participants were shown two of the major projects that are being now introduced in the health system

* Insured identity card: to be distributed among all inhabitants of the region as the main source of administrative information for the system. Applications are being planned in order to use the information collected in the process of using the card for payment to primary care doctors, access to primary care services, access to hospital services, etc.

* Primary Care Network Information System: a region wide information system, combining centralized maintenance of basic registers and decentralized execution of patient and professional functions.

ISU is responsible also for the maintenance and development of other applications created in the past which are fully operational today:

* Centralized Register of Personnel: A complete data base of all permanent and temporary workers of the "Catalan Institute of Health" employing some 34.000 employees on a permanent basis. Individual registers with all personal, professional and administrative information enable hospitals and districts to have access to a very powerful amount of information. Information is updated on a decentralized scheme, although central control is kept mainly on economic questions: no new employee can be introduced in the monthly payroll without central permission. Also, timely data on monthly payments is rapidly accessible.

* Centralized accounting and accounts payable system: The Catalan Institute of Health operates on a yearly budget approved by the Catalan parliament. Hospitals and primary care districts use this application to register all their

expenditures in the legally approved format. As a source of additional information, a permanent and updated status of the debt situation regarding suppliers is maintained from the decentralized level. This is later linked with the Ministry of Economy, which is the institution responsible for executing payments.

* Pharmaceutical consumption system: Drugs prescription from primary care doctors are billed monthly by the Associations of Pharmacists. The ISU introduces this information to the main computer and decentralized primary care districts and regional authorities control billing. At the same time, very detailed profiles of consumption by prescribing doctors are elaborated, thus allowing for a very efficient control of "over prescribers". Information at the individual doctor level reports economic volume, type of drugs, possible non-compatible drugs per patient, etc...

(ii) **Catalan Institute of Health.Management Control Unit**

The General Directorate of the Catalan Institute of Health has been working over the last six or seven years in order to define the information needed at the top of the organization in order to perform a timely and accurate management control of the 12 hospitals and 35 primary care districts under its governance. This Management Control Unit has done a very good job by analyzing all ongoing informatic applications and extracting from them the relevant data.

Participants had the chance to explore how this process had been conducted and which are the criteria used in order to select, prioritize and present the data in a selective and decision-making oriented manner. Relationships between the central unit and those existing at the decentralized level were also analyzed and participation-communication strategies were explained.

(iii) **Ministry of Health. Catalan Health Service.**

The Catalan Health Service has been recently created by integrating several former units of the Ministry. It is the organizational unit responsible for the financing of the Catalan health sector. It does not hold any operational responsibility for any provider. Its main mission is to develop the Parliament approved "Health Plan" and execute it mainly through contracts with providers.

Among its technical tools for strategic development and control of the system it uses several information systems. These are examples of some of those explained to participants in the study tour:

* Minimum Data Set Project: All contracted hospitals in the publicly financed network record individual discharge summaries, using ICD-9-CM coding. These coded discharges are sent in magnetic support to the Ministry. The Ministry uses this data in order to perform statistical analyses on key performance indicators. This information is used to guide the contracting policies and reflects changes in the case-mix and efficiency of individual providers. Participant hospitals are fed-back with their indicators, compared to those of other hospitals.

  Future plans include the re-processing of discharges through a case-mix software (DRG,PMC), in order to make information comparison easier and useful for management purposes.

* Central Register of Transplants: In the last decade a very aggressive policy in order to encourage transplants, specially kidney transplants, was introduced. The need emerged for a tight control of accredited transplant units as well as of waiting lists. Specific information strategies were put in place for kidney, marrow bone and liver transplants

* Health Plan Information Strategy: A task force was created in order to prepare the information base for the Catalan Health Plan. This task force performed a census of all general and particular sources of information and published the appropriate guide for all management levels to use. This guide gives detailed information about objective, scope, periodicity and author of all health related information bases in the country

(iv) **Emergencies System.**

Participants could see an example of an extremely successful unit where critical care operations are performed with the support of an information system. The Emergency System's mission is to facilitate prompt access to critical care to those patients in need following a request from a health care unit or professional, most frequently a hospital. Operations are based on a network of connected stations with critical care transport.

Information used during operations is used to plan services, make judgements on appropriateness of requests, evaluate receiving units' performance, estimate demand along the day, week and seasons according to social habits, etc...

2. CONSORCI HOSPITALARI DE CATALUNYA. (Catalonia Hospital Consortium)

Organizers arranged this visit in order to expose participants to a very common reality in western countries: individual providers joining an association in order to influence policy decisions, elaborate joint strategies in order to gain negotiating strength with suppliers, organize joint services in order to benefit from larger scale in the running and management of certain common services. etc...

3. FUNDACI AVEDIS DONABEDIAN

A very interesting private initiative put up by a group of doctors and economists interested in strengthening quality in our hospitals. The Fundaci Avedis Donabedian is active in developing accreditation standards for hospitals. It has been contracted by the Ministry to design and process the accreditation questionnaire that all hospitals willing to contract with the Catalan Health Service have to comply with. Information collected in the process is extremely helpful in order to determine levels of structural as well as operational quality of care in hospitals.

The Fundaci maintains a very good data base on quality control publications, performs a large variety of training activities and is frequently asked to consult with different public administrations.

4. BARCELONA CITY INSTITUTE OF PUBLIC HEALTH

A very active organization in charge of several responsibilities in the Public Health information domain. Its activities range from vaccination control, to control of food markets, water and atmospheric pollution. Periodically it conducts what is reputed to be the best health status survey in Spain. With a sample of some 25,000 families in the city it portrays the health status of the population, with

supplementary information on economic status, educational level, health related habits, etc...

This is the organization acting for Barcelona in the Healthy Cities WHO project.

5. CATALAN INSTITUTE OF HEALTH. BARCELONA PRIMARY CARE AUTHORITY

(i) "Josep Maluquer Primary Care Centre"

The Primary Care System of Catalonia is moving from an old scheme towards a new one.

In summary, general practitioners and pediatricians used to be assigned a population of approximately 2000 adults and 1500 children under seven, respectively. Payment was based on number of family-heads assigned and practice was done on a two-hour daily schedule, in addition to home-calls. Professionals used to practise individually, with a high level of pharmaceutical consumption, and low use of ancillary services, which determined a high ratio of referrals to extra-hospital specialists (in Spain this is an intermediate level before access to hospitals' outpatient clinics is allowed).

This model is progressively being substituted by a team-practice formula, where Primary Health Teams are assigned a certain geographical area of around 20.000 inhabitants. General practitioners and pediatricians are required to work as a unit, with a high degree of interaction with the nursing staff. A Primary Care Medical Record exists for every patient and preventive as well as curative activities are to be performed in the Team's catchment area. Professionals are paid on a salary basis, although differences are allowed depending on different parameters such as socio-economic status of the catchment area, population structure, distance to be covered, etc.. These Teams have decreased dramatically the expenditure in drugs consumption while, at the same time, increased the usage of laboratory and radiology. Referrals to specialists are also much lower and patient satisfaction has also been surveyed to be higher.

At the Jose Maluquer Primary Care Centre both models coexist for different catchment areas.

The methodology used to design, distribute and make the Primary Care Medical Record useful is particularly interesting. This is obviously a very important information element both for daily clinical practice as well as for epidemiological and planning purposes. The Team is also a "client" of information produced by itself or by other elements of the system. Thus, information monitoring levels of consumption of any sort is made available, as well as demographic information and individual based data. The latter is extremely useful where patients and families with health and social problems are contacted by the Team's nurses or social workers in order to tackle problems and provide support.

5.2. BARCELONA PRIMARY CARE AUTHORITY. CENTRAL OFFICES

This is the management unit responsible for the planning and operation of primary and specialist extra-hospital care for the city of Barcelona (1.7 million inhabitants). It also decides on patient-flows to hospitals, dealing yearly with an approximate number of 80,000 referrals.

The technical staff of the Authority explained the information system it uses for managerial and planning purposes. It is a system started in 1982 and has evolved into a very complex and ambitious system.

Information is collected from the centres regarding activity and periodic evaluations are conducted in order to verify quality of information and possibilities of simplication. In general terms all data is collected at the moment operations and incidences occur (appointment of visit, visit, laboratory orders, radiological studies, etc). No special purpose collection is made, thus preventing personnel having to spend part of their time filling forms specially made for the information system.

Other sources of information are the entry access modes to the centralised Register of Personnel, pharmaceutical consumption and accounting applications. The Authority can use this centralised system for its daily operations and has access to several outputs.

The Authority uses all these sources for monitoring the process of primary care transformation explained previously. Comparisons among old and new primary care centres are possible for evaluation.

A different system exists whereby the 80,000 referrals each year are investigated. In the particular case of surgical referrals, some 40,000, the Authority has developed an information system which is fed by the folowing sources:

- contracted hospitals periodically update their supply capacity in terms of quantity of patients and pathologies
- the unit in charge of daily decisions matches these capacities with demand coming from primary care centres and, mostly, extrahospital specialists
- monthly performance of hospitals is collected from the bills reception unit at the Ministry
- all of these inputs are then used in order to prevent waiting lists increasing and reward hospitals with better performance profiles
- patients are then referred to closest or minimum waiting list hospitals

6. OTHER HEALTH CARE PROVIDERS

(i) Fundacio Puigvert.

This is a specialist urological-nephrological hospital that was deemed as interesting for three main reasons:

- it is one of the pioneering hospitals in the development of a managerial culture and the introduction of sophisticated information management control systems;

- it is one of the few contracted hospitals where doctors are allowed to admit private patients, in addition to the patients admitted under public funding;

- in the recent times it has proved to be one of the most advanced hospitals dealing with medical record based clinical documents.

(ii) Hospital Mutua de Terrassa

This is another interesting example of a hospital belonging to a private insurance company which holds a contract for admitting publicly financed patients. It is implementing a vertical integration strategy, developing independent units for primary care, acute care and chronic care patients.

From the information systems point of view, it has successfully tested an American made fully integrated software package for hospitals. The insurance company owns an information systems company that sells its services to the hospital. This company has reached an agreement with a USA contractor and software developer, introducing some applications as they were originally designed. However, other applications have been reformed in order to match local legislation or procedures.

7. SOFTWARE COMPANIES

Czech and Slovak professionals need to be exposed to the marketing strategies of software selling companies. Two very different companies were chosen and hospitals where their products were installed were visited.

(i) Centre de Calcul de Sabadell/Red Cross Hospital

Red Cross Hospital is a county-intermediate hospital where Centre de Calcul de Sabadell (CCS), a local information systems company, has introduced its software for hospitals. Participants had the opportunity to discuss design, implementation and operational results with representatives of both the hospital and the company.

(iv) Shared Medical Systems/Hospital Clinic

Hospital Clinic is a large top level hospital linked with the University of Barcelona Medical School. It is one of the largest and best hospitals in Spain, with large teaching and clinical programs in kidney, liver and marrow bone transplants, open-heart surgery, etc... With 1000 beds and some 4000 employees it is reported to have high levels of excellence in research and in most of the specialities it offers.

Back in 1983 an American software company was contracted to install its information system. This was a fully American system and the hospital had to go through a long process of adaptation. Applications are now being fully interconnected and the system includes many department based applications. A large and well staffed computer centre has been set up.

8. CONTRACTS

Mrs. Roser Artal, head of the contracts unit of the Ministry of Health was invited to chair the closing sessions for both groups participating in the study trip. Mrs.

Artal is an economist who has done extensive practical work in the process of designing, negotiating and monitoring the more than 200 contracts that are now in existence.

The topics she introduced were extremely relevant for the audience since many technical and political elements that have been present in the development of the Catalan system can be traced to their equivalents in the Czech Republic and Slovakia.

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Better MANAGEMENT Better HEALTH

The health sector management project was the first investment by the European Communities PHARE programme in supporting the transformation of health services in the Czech Republic and Slovakia. Between April 1992 and April 1993 the project provided initial technical assistance in developing health sector management and information systems. Its aims have been to work with managers in the two Republics in seeking to understand the challenges of achieving radical transformation in national health systems; support these managers through on-site consultancy and a range of training opportunities; and use this experience to identify ways of strengthening the in-country capacity for management and information systems development in 1993 and beyond. The project has been undertaken by the King's Fund College, London in collaboration with the Instituto de Estudios Superiores de la Empresa, Barcelona and the South East England Institute of Public Health.

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Lessons from the PHARE Health Sector Management Project

Resource Guides:

I The In-country Health Sector Management Training Marketplace

II Postgraduate Study in Health Sector Management Disciplines in the United Kingdom

Educational Programme Reports:

1 Developing Health Sector Leadership (November 1992)

2 Developing Management Information Systems (March 1993)

3 Recommendations from the Brno Health Management Conference (March 1993)

Copies of each part of this Report are available from the International Co-operation Department in the Czech and Slovak Health Ministries or directly from David Towell at:

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