e-Transformation in Health

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PREFACE

Management of healthcare services is the most challenging issue in the world but at the same time leading one of the most important tasks for humanity. The underlying reasons for the challenge of its management are the difficulties encountered during the collection of the accurate and updated data and its conversion to knowledge after comprehensive analysis.

While there is a need for providing healthcare services to meet medical requirements accurately in sufficient time, it has vital importance to consider tens or even hundreds of parameters during the provision of these services on the other. It is indeed required great work and effort to analyse all the processes in needed detail and to collect healthcare related data accurately.

In modern world, it is better understood the importance of knowledge in management and in fact, "management of knowledge" is even became an actual issue. Therefore, while we are implementing the reforms targeting to provide equal, efficient and quality healthcare services in the context of Health Transformation

Programme that we started in 2003, we started another change and transformation era in order to establish National Health Information System in corporation with all these reforms on the other.

This era will pioneer by standardising the data that are producing during the healthcare services, as possible as the most detailed way, in electronic environment and collection through the sites directly where produced and registration in a centre. The data that are easily accessible, comparable with each other and analysed can be able to be in use in value added applications. Through the Decision Support Systems to be established, key support will provided to policy makers.

The first products of National Health Information Systems/e-Health Project gained in provinces, which Family Medicine System started. In spite of some challenges emerged during the transition period family physicians can be able to transfer their data related to healthcare services provided directly to our Ministry in electronic environment.

Our Ministry has the perception of owning accurate information in order to better management and at the same time, it has the potential and desire to increase our nation in deserved levels in e-Health area. There is only need to work with our all power left.

Professor Recep AKDAĞ, MD
Republic of Turkey, Health Minister

INTRODUCTION

When we make an overlook to the informatics projects that our Ministry implemented recently, it has been realized that they satisfied the requirements for institutional needs. However, Health Transformation Programme launched in 2003 was the beginning of a new era in health informatics and e-Health, and institutional informatics projects have been replaced by more added value citizen centric e-Health Projects anymore.

Since health informatics and e-Health projects necessity, initially most of the studies performed were on determination of the health data standards. Thereafter, in order to collect data from nation-wide healthcare institutions and to build common language in particular, development of National Health Data Dictionary has been commenced and besides gathering, the various combinations of data elements, the activities regarding establishment of Minimum Health Data Sets has been launched.

The data that will be collected from healthcare institutions via Minimum Health Data Sets will be gathered in Electronic Health Record database, and these data will analyzed through the Decision Support System, which is to be developed.

Detailed analyses show that all these activities will bring together different type of studies such as determining the data standards as a basic level and getting knowledge from data as higher level. They are indispensable elements for an information system to be implemented country wide.

All these studies mentioned above will contribute healthcare services management in the near term. Our country has significant brainpower especially in the informatics area. If this power can be directed in right way, it would be easy to say that we could reach to the level of the developed countries. Implementations performed so far are the good examples for this.

As a matter of fact, we can say that in the e-Health area, we are getting close to the levels of very few countries, which is similar in terms of geography and population to our country. On the other hand, in order to stay parallel with the latest development, we are following up e-Health and e-Health interoperability activities in European Union Countries, and adapting the international standards.

Department of Information Processing
e-Health Project Team

TURKEY'S HEALTH INFORMATION SYSTEM (THIS)/ e-HEALTH

Information and Health

e-Health; is using all the functions of information and communication technologies in order to improve the health of citizens and patients, increasing access to health services and delivery of effective and productive services of good quality for all the shareholders in health sector.

It has been seen that the Internet and information technologies, including the e-Government, e-Health and e-Finance are started to be used in more fields everyday. At least, it wouldn't be wrong to say that these concepts have considerably good meanings for us and that we hope that these applications would make our lives easier. However, considering the success rate of information projects in the world, these kinds of projects' success and their positive impacts on our lives cause labor incentive and multidisciplinary works.

On the other hand, it's obvious that successful information technologies projects will make great contributions to institutions in terms of effectiveness and productivity. Information technologies projects which are carried out nationally, such as e-Health in particular, it's vitally important to analyse successful and unsuccessful examples in the world in order to make correct determinations

and take lessons from the mistakes. We shouldn't forget that technology is a tool which is impossible to be ignored; but the technology alone isn't the solution of everything.

When compared with other sectors, health sector comes at top of the information-sensitive sector. Health sector is the sector where information changes most quickly in terms of context and structure. Thus, again health sector comes at top of the sectors that information and communication technologies influence the most. Therefore, it's envisaged that health will be the field in which information and communication technologies will be used in the most sensitive way in the next quarter century in the world and citizen-oriented health services and such telemedicine methods as remote diagnose-treatment, consultation and telecare will be utilized commonly.

Background of e-Health

Conducted Analyses

e-Health studies which are professionally conducted by our Ministry are based on the studies on Turkey Health Information System Action Plan (www.saglik.gov.tr/tsbs) which were started in 2003 and completed in January 2004. This plan was prepared as a result of a very intensive work with 10 separate working groups including governmental institutions, universities and non-governmental organizations. It can be said that the e-Health

studies which are still underway, progresses in the framework of this document.

The "Architectural and Technological Infrastructure Analysis of Health Information Systems" study which was completed in May 2004 with the donated credit and performed by foreign experts just after the Turkey Health Information System Action Plan Studies have made important determinations as well. It has been included 15 action plans within the e-Transformation Turkey Project Short Term Action Plan, carried out in coordination with the State Planning Organization, and 5 actions regarding e-Health within the action plan for the year 2005 Actions have been completed to a great extent and standards of health information which are critical for e-Health were determined and put into practice.

In addition, Turkey's e-Health Project was proposed to the International Telecommunication Union (ITU) by taking the future needs into consideration, the proposal was accepted and the actions initiated cooperation with Dr. Salah MANDIL who gives high-level consultancy services on the issue of e-Health in many countries in the world. Turkey's e-Health Project is one of the rare supports provided by the ITU for Turkey. Dr. Salah MANDIL and our Ministry's Information Technologies experts have prepared detailed road maps for Turkey's e-Health Strategy and Application in October and November 2004.

As it's seen that, the year 2004 was a year

in which, continuous analyze studies were conducted, the subject's examples in the world were examined and national road maps were prepared. İt is possible to say that, it is the first time, our Ministry reached a level where he shows the road and specify the standards regarding health informatics by using his experience gained on the issue of technology requiring expertise,

What did the "Program of Transformation in Health" bring to e-Health?

The Program of Transformation in Health was prepared in order to organize, finance and delivery of health services effectively, productively and equitable.

Effectiveness means the aim of improving the health level of our public through effective policies. The main target in the delivery of health services must be the prevention of people from the disease

Productivity is the proper use of the resources by reducing the cost and producing more services with the same resources. Distribution of the human resources, management of materials, rational drug use, health administration and preventive medicine practices should be evaluated under the framework of this goal.

Equity is the achievements of the access of all citizens in Turkey to health services and their

contribution to the finance of the services on the extent of their power.

Health Transformation Programme consists of 8 components which have been formed to cover the sector with all its dimensions. Each component is matched other component and covers the solution appropriate for the programme. These components are as follows:

1- The Ministry of Health as the Planner and Controller

2- General Health Insurance Gathering Everybody under a Single Umbrella

3- Widespread, Easily-Accessible and friendly Health Service System

4- Health Manpower Equipped with Knowledge and Competence and Working with High Motivation

5- Education and Science Institutions Supporting the System

6- Quality and Accreditation for Qualified and Effective Health Services

7- Institutional Structure in the Management of Rationale Medicine and Equipment

8- Access to Effective Information at Decision Making Process: Health Information System.

An integrated health information system is needed to provide harmony between all the components of the Transformation in Health Transformation Program. The Health Information System will be established in order to provide coordination in health services,

establish the health inventory, protect the individuals' medical records, and carry out the information transfer during the levels of forward and collecting data in basic health applications. This system will provide a great support to the healthy analysis of data and decision makers and health policy makers.

e-Health Project

Turkey's Health Information System (THIS) Project was initiated on January 30, 2003 with the participation of representatives from governmental institutions, non-governmental organizations, universities and the private sector under the coordination of Ministry of Health in order to establish cooperation among the sectors and national health information system's infrastructure. In accordance with Turkey's Health Information System, the national vision was determined and 10 working groups were established.

e-Health studies' vision: The national health information system to be established with the contribution of all the actors working in the health sector (governmental organizations and institutions, universities, non-governmental organizations, private sector, etc. taking, presenting, financing and supplying the health service) in the country is based on sharing a functional database which is accessible by authorized people and institutions with defined access rights, that covers all the citizens and in

which each individual can reach his information and which consists of all the   data concerning the health from the birth and throughout his life on a spine of communication with high-band width throughout the entire   country and using the   technologies   reaching   telemedicine applications in professional practice.

Firstly, study groups evaluated the health sector's current situation in terms of information and communication technologies in the entire country, dealt with the developments in the world, determined the works necessary to be conducted in the field of health information in detail and published Turkey's Health Information System Action Plan with the workshops in January 2005 which were held incentively   throughout the year.

In the framework of the e-Transformation Turkey Project which was initiated under the coordination of the State Planning Organization within the framework of the Urgent Action Plan, Ministry of Health has undertaken the coordination of e-Health Study Group. The Short Term Action Plan which was published on the Official Gazette by the Prime Ministry's Circular dated December 4, 2003 and numbered 2003/48 consists of 15 actions concerning e-Health. 15 e-Health actions were determined by giving priority among Turkey's Health Information System Action Plan.

In the scope of the e-Health activities, health information standards which are the health services' preliminary needs have been

specified and started to be applied; within the terms of the Transformation in Health Program, the project of information system has been completed for the Family Physicians; the coordination necessary for the exchange of electronic data between the health service providing and health service financing was ensured, a protocol was signed and projected between the Ministry of Health, Ministry of Finance, Ministry of Labor and Social Security and Hacettepe University, the needs were determined concerning the issue of e-signature for providing the security, privacy and confidentiality regarding health records and the cooperation platform was formed with universities in order to establish the human resources who are trained in the field of health information.

The "e-Health Project Proposal" was prepared by taking future needs into consideration and presented to ITU (International Telecommunication Union). The project proposal was accepted by ITU and published on the World Information Society Summit press release (Turkey's e-Health Project) in Geneva in December 2003.

The Information Society Strategy and the attached Action Plan approved by the High Planning Council dated 11/07/2006 by number 2006/38 has been take into force after published in the Official Gazette dated 28/07/2006 by number 26242. In the action plan, 4 actions are taking place under the

responsibility of our Ministry which are **"Establishment of the Health Information System"**, **"Data Sharing between Blood Banks"**, **"Online Health Services"** and **"Telemedicine Systems"**.

Those actions are mostly completed and the studies carried out to establish the "health data operation centre" under the scope of e-Health Project has reached the last stage. By the end of 2007, the data operation centre that will store the Electronic Health Records will completed.

The years 2005, 2006 and 2007 are the years that the applications realized.

Electronic means instead of paper: Minimum Health Data Sets...

The activity of determining the **National Health Data Dictionary (NHDD)** and **Minimum Health Data Sets (MHDS)** is extremely important for our country. It's obvious that, true information in the management of the health system can save many lives. In other words, information is one of the most important elements in our medical treatment. However, one of the biggest problems of our country is emerging just at this point. Although great efforts are exerted and costs are spent, unfortunately the correct data can't be obtained from the field. Turkey's Health Information System Action Plan which is carried out under the coordination of our Ministry put forth the analysis of its reasons

and evaluation of solution alternatives.

National Health Data Dictionary is a dictionary which aims to enable the parties to produce and to use the data to understand the same meaning from the same data and use them for the same purpose and define all the necessary data in detail. The first version of the National Health Data Dictionary is established in 15 June 2007. Minimum Health Data Sets (MHDS) are formed from this dictionary as well. MHDS will define the data sets which emerge at the time of presenting a certain service, for example, Infant Monitoring Data Set, Pregnant Monitoring Data Set, and will be sent to Ministry of Health by the information systems using open technology (XML Web Services, etc.). There were serious problems on analyzing these data which were delivered with hard copy from health institutions to Provisional Health Directories (PHD) and then to Ministry of Health until now, but now they will be recorded at the places they were produced and delivered to the Ministry of Health electronically.

Using the National Health Data Dictionary and the Minimum Health Data Sets will strengthen our Ministry's discipline concerning the data collection. Considering the current situation, we see that the Ministry's central organization units request all the information that they need nearly from all the provincial organization units. However, when it is determined that who needs which data and why, and that when and by whom the data produced in the

field, the data from the field is collected in a single data pool, it will be possible to collect data of better quality with lower cost. The most important thing is that, establishing the Decision-Support System, detailed analyzes will be made and Health Policies will be determined with more scientific and technical methods.

Family Medicine and e-Health

Improvements on the Primary Health Care service in our country caused the common use of information technologies. The problem of wrong/ lacking information and bad quality has occurred because the data has not collected from the place where produced. It is now, solved with the Family Medicine Information System (FMIS), which is implemented with the Family Physician application. It started in Düzce as the first stage and the application of FMIS started on the targeted 10 cities by the year 2006. The data concerning the processes carried out by Family Physicians can be delivered to the Ministry electronically and securely by FMIS. The application of FMIS is one of the e-Health applications, which will find the possibility of the most common usage in the entire country.

Not Institutional, but Citizen-Oriented Approach: e-Health

Besides such benefits as meeting the

e-Health institutional needs and removing current problems, the FMIS sends the citizens' health data to the Ministry in the form of Minimum Health Data Sets and enables another doctor with the possibility of accessing these data with the consent of the patient when needed. Thus the FMIS will contribute to the effective service delivery and the service quality directly. On the other hand, it will send the data automatically, reduce our health personnel's such administrative work as preparing reports and information forms and increase the productivity of our health personnel whose main duty is to provide health service.

The possibilities that it would provide in monitoring the chronic and epidemic diseases and such incidents as birth and death and baby, child, female and pregnant monitoring reports will help recognizing direct risks and threats against our citizens' health beforehand and making the intervention urgently.

In these years in which information technologies have greater impacts on our lives, we think that a health management without "e" won't continue anymore and a health system maximizing the citizens' satisfaction is extremely important for our country in the cycle of development and change. Therefore we aim to establish a new record discipline based on the technology allover the country, starting from our family physicians giving basic health services.

e-HEALTH PROJECTS

Family Medicine Information System (FMIS)

Electronic health records from antenatal until death

FMIS application is based on the principle that each individual's having a family physician to take care of his health. Thus, everybody will have a physician whom he addresses directly in every issue concerning his health problems. This unity of physician and patient deriving from the nature of the application of FMIS provides an important opportunity in terms of recording the health records in accordance with a certain discipline. FMIS application follows an individual from the time of conception and maintains the information on his health. The individual's development in his mother's womb, the method of birth and other information on his birth are entered in the application of FMIS and kept in the information bank under the doctor's surveillance. This data will be an important resource of information in curing the individual's future health problems.

The FMIS will be close to the individual from his birth until his death. When necessary, he will carry out the vaccination for babies and children and birth control of the pregnant women, closely follow the patients' health and give them advice. The FMIS will visit examine and cure the patients who can't visit him due to his health problems at their homes.

In short, the FMIS will be close to each individual who depends on him in all of his health problems from his birth until his death.

e-Health at Primary Health Care: FMIS

The health consultancy and the treatment of diseases start with the Family Physician who deals with the patient personally. The Family Physician examines and cures her/him and gives the necessary advice. The patient receives friendly medical treatment from the Family Physician who knows him/her closely and thus she/he doesn't need to go to crowded hospitals even for a little sickness.

In the systems having online laboratory integration, Family Physician's test requests can be sent to the laboratories that are connected online. Again, the results of the tests done in the laboratory can be sent online automatically to the Family Physician. The only thing that the patient must do is to go to the laboratory carrying without any documents. Therefore, patients don't have to worry about bringing the results to the Family Physician.

If necessary, the Family Physician refers the patient to the secondary health care services, in other words, to hospitals' relevant departments. This method prevents the individual from going to wrong departments within the hospital and suffering from the waste of time and stress.

In Family Medicine Application integrated with the online reservation application, Family

Physician can make a reservation in the detail of hours even minutes from the hospital (second level) according to the department where he has send the patient. The patient can be examined, being in the hospital at the time that the Family Physician has made the reservation for himself. By this mean, the patient can be examined without any waiting for the queue and losing any time in the hospital that he must go to for the advanced health check-up.

Demographic information, diagnosis and reservation request of the patient send to the second level hospitals for consultation by the online reservation application are reached to the hospitals online. The diagnosis and test results of the patient found as a result of a series of examinations done in the hospital can be again sent electronically online to the Family Physician after recording to the consultation result. By this mean, Family Physician can check-up and control his patient reaching the detailed information about the patient.

Current and correct data:
Data is collected from its resource now

The Family Physician records the information of the individual whom he deals with to the "FMIS" application. Thus, during their next meeting, he will easily know the patient's previous diseases and the type of medical treatment that he has received. Thus, data will be recorded by the physician in accordance with his statement and it will take the most correct form.

The Ministry's relevant departments will generally observe current information on health and the investment to have to be made on the region where the Family Physician is located will be the most right investments. Thus, the given service will be on the top level.

In the Family Medicine Application which take into consideration of the preventive health service, whether the babies, children, pregnant and confined are checked periodically in the period determined by the Ministry or not is decided by the analysis using the decision support systems. Preventive healthcare service is forced by the health records constantly checked and analyzed. Lots of possible health problems are avoided or early identified by the periodic controls and vaccination.

The Family Medicine Information System is applied first in Düzce province in September 15, 2005. Until the end of August 2007, the system has been deployed in 12 provinces (Düzce, Eskişehir, Bolu, Edirne, Denizli, Adıyaman, Gümüşhane, Elazığ, Isparta, Samsun, İzmir, Sinop). The deployment of the system still continues and at the end of 2007 it will be deployed in 8 provinces as well. Therefore the number of the provinces that the system is deployed will be reached to 20. The deployment will continue in 2008 and after.

National Health Data Dictionary (NHDD)

Firstly, unity of terminology

In our country, all the studies which are aimed to be conducted on issues of statistics, monitoring and evaluation and quality generally suffer from a common problem. This problem is that the data which was collected from the field and on which statistical and analysis was done and measurements were made in accordance with the quality criteria are not defined in the same way by relevant institutions and persons. In other words, a terminological unity can't be ensured on the data which was used. This situation causes such results as the desired and given data are not the same in essence and the goals which were targeted might be damaged by collecting the data on the field.

Therefore, the National Health Data Dictionary (NHDD) is completed and published in june 15th 2007 in the scope of the National Health Information System (E1 component) which is under the responsibility of our Ministry's Department of Information Processing and conducted in the scope of the Transformation in Health Program. There are 45 data set and 257 data element in the National Health Data Dictionary.

Let's see what the data that we have requested and sent is

The data whose definition and format

determined within the NHDD will establish a reference for the information systems used at health institutions. Thus, even if different applications are used at health institutions, the format of the data will be the same. Therefore, when it is requested, demanded from relevant institutions, each institution will be able to obtain the data from the Minimum Data Sets (MDS) to be established by choosing from the data defined within the NHDD.

Thus, the parties producing and requesting the data will be able to define the data in the same way and the parties will know what they have produced and requested in a better way.

Minimum Data Sets (MDS)

Which information would you like to collect? Data sets appropriate to needs...

NHDD is a dictionary which is a reference on the issue of health in the entire country. As the data elements to be used at the institutions where the health services are furnished on different levels will be defined within the NHDD, the data which were recorded by complying with same standards will be able to be requested from relevant institutions, if needed. These data groups to be used on this new structure which will become a national standard on the issue of data collection are called Minimum Data Sets (MDS).

The data which have been collected on

papers until now will be able to be delivered directly to our Ministry in a quicker and more correct way by using the infrastructure of developed communication and information technology by the help of the MDS system. Furthermore, MDS will be a changing and an updateable structure. In other words, when a new data has to be collected from the field, MDS will be updated in certain periods and changed in a way to meet the need. This approach will obtain a more comprehensive structure after adding administrative and financial data sets to other data sets which were initially developed for the purpose of collecting the health data.

Bureaucracy will decrease, productivity will increase...

MDS' with its easily updateable structure will turn this current situation, which is rather unproductive in spite of all the efforts exerted on the issue of collecting data from the field, into a more flexible, rapid and productive one. When new information is needed, firstly such issues as whether this information is really needed and whether it can be obtained from the current data will be dealt according to a standard procedure. If this information involves the definition of new data elements within the NHDD and inclusion in the MDS, this work will be conducted in accordance with the new procedure. The work which is conducted this way will be reflected to MDS s in certain periods

of the year and it the information systems which are used on the field will be requested to be designed in accordance with this structure. Thus, data received from the field will continue to deliver automatically.

In addition, the procedures which should be followed in order to carry out all these processes will provide our Ministry with the possibility of obtaining a stronger discipline in issues of reaching information and producing policies.

45 Minimum Health Data Sets (MHDS) defined and published in the National Health Data Dictionary (NHDD)

Health Coding Reference Server (HCRS)

e-Health's basis:
Coding and Classification systems

If the data collection, analysis are mentioned in a system, firstly the mentioned data should be defined. The aim is to meet this need with the NHDD. However, it's not sufficient to define the data. Certain data elements need a coding/classification system. If the aim is to collect and evaluate the data throughout the country, a common coding/classification system should be used throughout the country for this data.

Actually many examples like plate codes, postal codes, etc. have taken their places in our daily lives. However, we can't see the same

standardization in the health sector sufficiently. Therefore, the data which are needed to be coded gathered from the data collected in the field of health in a system called the Health Coding Reference Server (HCRS). System codes published in the Health Coding Reference Server (HCRS) are:

ICD-10, Drugs, ATC(Anatomic, Therapeutic, Chemical Classification System), Associations, Clinics, Specialization, Careers, Budget Application Instructions, Health Application Instructions, Supplies, Vaccines, Baby Monitoring Calendar, Pregnant Monitoring Calendar, Child Monitoring Calendar and Parameters.

Same codes in different systems...

The HCRS is shared with an open technology XML web services and used in   software projects which were developed in the issue of health. After the HCRS is used as a reference, all the information and data systems which are used at health institutions will be defined and they will use the same codes. This work means that   minimum data sets which are aimed to be collected by the Ministry are standardized. HCRS is accessible from the web site

(http://www.saglik.gov.tr)

Problem of the century: "Interoperability!"

When we look at countries, which have developed important projects in the informatics subject, we can see that the problem they are trying to solve is 'Interoperability". Considering particularly the studies which were completed in the field of health successfully, each of them have reached the result with different approaches as their nature required and each country have produced certain solutions in accordance with their priorities. However, after carrying out the priorities, the focus is on turning the results gained into a disputable and discussable structure with other countries' results. However, this is not that much easy. Similarly, making a system interoperable with other systems is generally more difficult and complex than developing and operating a system.

Therefore, we are trying to develop the information projects which we conduct in the field of health in our country as much as we can and particularly in accordance with the systems in European countries. However, unfortunately, we should note that the situation of European countries in the issue of the Interoperability isn't seem to be very encouraging either. They have been organizing conferences on the issue of Interoperability "often in recent years and showing a common will about conducting their future projects in a multi-partner way. We hope

that the work which is carried out in our country will find the opportunity to work together with its equals on the same field as soon as possible.

Teletraining and Telemedicine Applications

Distance health learning has started

The Protocol on Receiving Satellite Communication and Video Conference Service between the Ministry of Health and Türksat A.Ş. was prepared in order to spread the teletraining services (remote health services) between the Ministry of Health's Training and Research Hospitals to make it possible to access distance learning and digital libraries and spread medical training.

Protocol's coverage area and conditions are as follows:

• There are 46 Training and Research Hospitals, General Directorate of Health Education and Ministry of Health's central organization In the scope of the protocol,.

• At least four hospitals will be able to carry out Video conference with each other at the same time.

• The satellite communication network to be established will be used within the value added services. For example, Internet access, IP telephony, portal services, etc.

• For only once, training and Research Hospitals will undertake the cost of apparatus

that comes out the Multi Conference Unit (MCU) to be located at Video Conference, satellite access and Türksat satellite center, and they won't pay a price for the rent of satellite communication and fixed costs of it will be met by the General Directorate of Health Education.

Telemedicine: Remote health care services in Radiology and Patalogy started.

The "eTransformation Turkey Project" that was included in the 58th and 59th Government Urgent Action Plan was launched in 2003 and coordination of "e-Health Group" assigned to the Ministry of Health. Information Society Action Plan was taken into action on 28.07.2006 in Official Paper with reference no 26242 after approval by High Planning Council on 11.07.2006 with reference no 2006/38. That Action Plan includes 4 actions, which one of them is to implement telemedicine systems.

Telemedicine project proposes following features; to satisfy the lack of experts in imaging area, to get the second opinion in complex cases, to increase the quality patient care and to provide best diagnosis and cure for the patients.

Project aims that health care services will be provided in Radiology and Pathology by using Information and Communication technologies in the second and third health care pilot hospitals. Also it will compensate the lack of experts and provide reports for first or second opinion.

Pilot Project includes 14 State Hospitals

throughout the Turkey. 9 of them defined as Sending Hospitals (require consultation) and 5 of them define as Receiving Hospitals (provide reporting services). All the Receiving hospitals stated in Ankara province. Department of Information Processing which manages the telemedicine services defined as Telemedicine Center and behaves as a gateway between Sending and Receiving sites.

Telemedicine project will be enlarged to the other state hospitals from the beginning of 2008.

The telemedicine service aims to provide following benefits:

• It can to be used in fields of diagnose, treatment, training, management, research, medical follow-up and treatment control, evaluation of patients in natural disasters and big accidents, decision of triage and pre-transfer planning, community's health and the protective physician work.

• The quality, effectiveness and productivity of health services which are presented will be increased.

• Specialty centers will be provided with the possibility of consulting each other by the help of telemedicine.

• Exchange and share of electronic information will increase.

• It will cause the productive use of our limited resources and the emergence of patient satisfaction.

• It will be a tool for presenting common and cheap health service of good quality.

• It will provide possibility for such applications as tele-radiology, tele-pathology (tele-dermatology and tele-cardiology will include later).

Green Card Information System (GCIS)

According to the Law numbered 5222 amending certain articles of the Law on Meeting the Treatment Expenses by the State by Giving Green Card to Citizens Unable to Afford numbered 3816 which was published on the Official Gazette dated 21.07.2004 and numbered 25529, medicine costs of green card owners will be evaluated as a part of the Law and the prescriptions which were written accordingly will be able to be supplied from private pharmacies.

The performance of this application without any defect will be possible by the establishment of certain control elements. With in the context of it was planned to benefit from the Directorate General of Retirement Fund's Health Expenditures Control Project and therefore our Ministry initiated the Green Card Information System (GCIS) application on 09.11.2004 in order to keep the records of owners of autocopied green cards and the people who will take the green card, in one center and so these people can fully benefit from the health aid.

The Green Card Information system is a web-based application and used online from 81 province centers and 932 district centers. In this system, processes of registration and update are conducted by Green Card Offices which take and evaluate the Green Card applications, in other words, which have the Green Card Registration Book in all the district centers in Turkey. The system has more than 1,700 users and works 7 days and 24 hours.

How many green card owners are there in Turkey?

Before the GCIS project was implemented, no information could be ensured on the identity of green card owners. Because local administrations were distributing the green cards and the information wasn't recorded on a central system. All the green card owners were recorded on a central database in our country for the first time within the GCIS. The number of Green Card owners which was shared with the General Directorate of Pension Fund is 14.010.898 as from 26 August 2007 as part of this project.

According to the circular of the General Directorate of Curative Health Care dated 16.04.2007 and numbered 7974 and the regarding the aforementioned circular a new circular dated 17.05.2007 and numbered 7974(2007/28), the implementation of automatic visa control have been started at Green Card Information System on

28.08.2007. By 26.08.2007, the number of green card 8.519.337 have active green card, the remaining 5.491.561 cards are inactive due to their visa control. The changing on registered people who have green card and the green card registrations at General Directorate of Pension Fund have been daily updated regularly by our Ministry.

Great facility for Green Card owner citizens

1- To keep the records of the people who has auto copied green card and who will take later in one center,

2- According to the Law numbered 5222, providing green card owners with the possibility of benefiting from the health aid more effectively and making their medicine supplies during their outpatient treatment,

3- Enabling the surveillance and control of Green Card owners' outpatient treatment costs,

4- If the distribution of Green Card Information System records in accordance with province/district centers are evaluated as an indicator of the socio-economic distribution in the entire country, using this data to shed light on the economic-health and social aid to be made in the entire county,

5- Sharing the green card owner information which is collected at one center with all the necessary and relevant Institutions, Organizations and/or Legal and Natural persons.

Doctor Data Bank (DDB)

This system tells who is a doctor in Turkey...

Our Ministry gives the work license on the issue of working as a doctor in Turkey. However, the information on doctors who were given the work license and whose specialties and diplomas were confirmed throughout the history of Republic used to be kept on books until now. The diploma/specialty information concerning the doctors in our country was recorded with their Turkish citizenship numbers for the first time with the Doctor Data Bank (DDB) project in our country. This database will present useful information and play a greatly important role in many projects, mostly in the projects conducted with payer institutions.

Great facility for Payment Provider

Most of the rules conducted by payment provider on the issue of controlling the health service and prescriptions require knowing the doctors' areas of specialty. For example, if there

is a rule indicating that only the doctors with a certain specialty training can prescribe certain medicines, it should be known that the doctor who has signed the prescription is a real doctor or not and then if so, it should be learned whether it is his area of specialty. Before the DDB project was implemented, unfortunately, it was hard and even impossible to run such rules.

For the first time, it becomes possible for payer organizations to query the doctors on a central system and accept the information derived from there as a basis for their rules by the DDB project. The DDB project is still at the testing stage and payment provider can use the data which they took from there without putting into force. Relevant institutions signed an official protocol mutually and started the real implementation in the last quarter of the year 2006.

Patient Rights Information System (PRIS)

Now patients look for their rights as well

In the scope of the Patient Rights Regulation of Health Services Basic Decree in the Force of Law numbered 3359 which was formed in our Ministry's hospitals by a web-based application which was developed through our Ministry's web page, it became possible to record the applications of our citizens on a database and if the registration is successful, it e-mails the password concerning his registration to the citizen upon request.

The mechanism of evaluating the applications was established and so that the applications which are transferred to the system by hospital officials and officials from the General Directorate of Curative Services' Patient Rights Department can be examined and an appropriate answer is given to citizens. Users which were authorized with appropriate permissions can carry out questionings on the basis of relevant country, province and district with these records.

Now 829 hospitals are working in this scope and all of our hospitals will be included in this application until the end of the year.

Ministry of Health Communication Center System (MHCCS, CALL 184)

184 MHCCS Ministry of Health Communication Center listens and evaluates our societies all kinds of problems, complaints and suggestions concerning our Ministry, immediately intervenes in these problems on site and finds solutions for them and aims to accelerate the bureaucratic process and improve our Ministry's service quality.

The call center was established with the phone line numbered 184 at the Ministry's center and the public's access with a single number was ensured.

All the citizens can access MHCCS through fixed and mobile phones.

All the provincial health directorates, 804 state hospitals and 500 district group chairmanships were included in the system.

MHCCS makes online connection with one manager (provincial deputy director, deputy medical superintendent, health group chairman) from each 81 provincial health directorates, 804 state hospitals and 500 district health group chairmanships and ensures the data flow between both the citizens' applications and the central and provincial organizations in different formats.

Why MHCCS?

By the "Project of Transformation in Health" which was implemented in 2003 it is planned to find solutions with a new point of view for the health sector's problems, which were not solved until now and increased after not being solved, and therefore which are perceived as unchangeable.

As this project has been presented for a long time, it's not acting through the problematic patterns which were accepted as a part of the system, but it's considered as a basic way out that the problem will be solved by starting here.

MHCCS has flamed the public's desires again that have turned into hopelessness and initiated an action plan which can be owned by all the parties with a great participation and in which all the parties can play an active role.

MHCCS is an important step which was taken in order to find immediate and concrete solutions for the impatient problems of our society to implement this desired change.

Desired Change Is Happening

This project's basic aim is to improve the life quality of all the citizens living in Turkey, meet their demands which have been postponed for years and enable them to make their voices heard by up to the top-level official. It will also enable using the country's possibilities in the most reasonable way and finding the most   productive solution as soon as possible.

How Can I Access?

The phone line numbered 184 is directed to the call center in Ankara throughout the country.

When Can I Call?

The center in Ankara answers the calls for 24 hours and 7 days the calls at the centers which are equipped with the advanced technology. Not the robot system, but by operators consisting of health personnel who are equipped with sufficient information,

talents and well informed about the health legislation and working with high motivation are answered by.

The sound records of phone conversations which were made are archived in order to provide self control and use if necessary.

Now the Solution is very near

The recorded reports, complaints and demands are directed to the solution units, after being evaluated by the officials from MHCCS.

Health Directors and Deputy Directors were appointed as MHCCS solvers in 81 provinces for the MHCCS project. These solvers immediately evaluate the problems that they receive about their regions, carry out and conclude necessary researches and examinations and make feedback to the applicants with effective and appropriate solutions.

Officials working for MHCCS undertake a planning, controlling and surveying role in controlling this traffic which is flowing on the Internet.

As a result of their investigations and interrogations carried out for current applications, relevant MHCCS solvers warn the institutions and persons whose neglect was found and carry out necessary intervention and sanction as well.

Besides the applicants' reports and complaints, their suggestions and requests are directed to relevant units of our Ministry's

central organization and the problems that they experience in their fields of responsibility are rapidly followed from the formed data pool which was formed.

Our Goals

• The current situation of presenting service to our citizens won't be considered sufficient and always the better one will be searched and a feedback mechanism which will enable the system to evaluate itself will be established and lessons will be taken from the mistakes.

• Each health institution will be responsible for its service quality and productivity and our citizens will control it themselves.

• As the ability to see the operating and non-operating sides of the system makes it possible to make corrections, a transparent management will be displayed.

• Current communication and dialogue between the Ministry's Central Organization and Province Organization will be strengthened and local managements will be provided with the freedom of movement in a way not to harm the main system.

• Receiving all the relevant parties' views and suggestions in MHCCS project will include all the components of the health sector within the scope of the system and establish a unit of resource and a basis of consensus in practice.

• Determining the current system's deficiencies and making small but effective

interventions on them will provide a step by step but continuous improvement and trigger a permanent change and development.

• The records which are collected and stored in the MHCCS project will be able to be used in transforming the data into the information, analyze it and planning the resource and investments in the health sector.

• As the quality of health service which is furnished with the MHCCS project is evaluated, it will be easier to determine the sector's problems and priorities and take measures for them.

MINISTRY'S INSTITUTIONAL INFORMATION TECHNOLOGIES PROJECTS

Core Resource Management System (CRMS)

For an efficient management, effective resource management

The effective use of resources in delivering the health services will reflect to the quality of service which is furnished just like in every field. For this purpose, our Ministry has implemented the "Core Resource Management" project.

The CRMS is a system which collects the Ministry of Health's Central Organization and 81 provincial health directorates under the same roof. The project's aim is to present correct and current information support to decision makers on every level in order to follow

and direct the human, material, financial and Drug -pharmacy resources.

The CRMS project is an integrated system consisting of four main groups and sub modules. Four main modules constituting the project are as follows;

1- Human Resources Management System (HRMS)

2- Material Resources Management System (MRMS)

3- Finance Resources Management System (FRMS)

4- Drugs and Pharmacy Information System (DPIS)

Sub modules constituting the main modules are given in the table below.

	CLUSTERS			
	HRMC	FRMC	MRMC	DPIC
SUB MODULES	Appointment Information System	Budget Information System	Stock Information System	Pharmacy Information System
	Registry Information System	Accounting Information System	Vehicles Information System	Drugstore Information System
	Position Information System	Procurement Information System	Fixture Information System	Firm Information System
	Promotion Information System	Building Information System	Medical Equipment Information System	Responsible Manager Information System
	Salary and Accruement Information System	FRMS Application	Maintenance Information System	Preparations Information System
	Training Information System		MRMS Application	Controlled Substances Information System
	Inservice Training Information			Cosmetic Information System
	Disciplinary Information System			DPIS Application
	Law Information System			
	Personnel units Information System			
	HRMS Application			

The CRMS Project in which all the applications are performed in accordance with a web-based architecture, the Local Area Network (LAN) infrastructure was established in the Ministry of Health's Central Organization and 81 Provincial Health Directorates in the

form of a "Star Network Topology" and the "Frame Relay" telecommunication service was allocated from Türk Telekom for the connection between PHD s and the Central Organization.

From now on in addition to the 81 Provincial Health Directorates the all modules of CRMS can be available for Hospitals and Local Health Directorates.
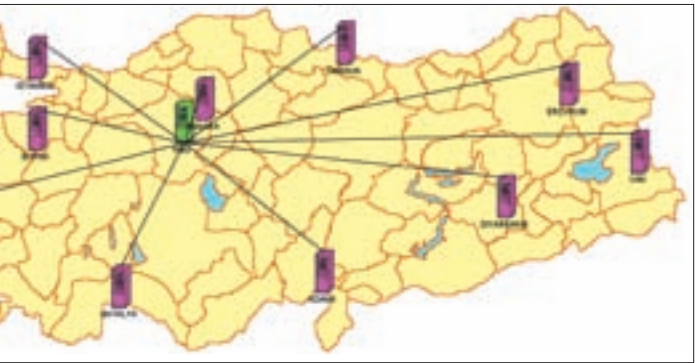
Basic Health Statistics Module (BHSM)

Turkey's health in figures...

Now, health statistics can be sent to the web-based central database from 81 Provincial Health Directorates, Public Hospitals and Public Health Centers

The institutions and organizations provide the data used in the field of health statistics, which are active in this field through the data information forms used by the Ministry of Health as well.

The data which is sent from health institutions to Provincial Health Directorates and

then to the Ministry's central units and the data sent with the BHSM electronically are evaluated on a level that is found necessary by decision makers and compiled and reported in order to meet the management's needs on site. The BHSM consists of the Ministry's central organization and all the Provincial Health Directorates.

There are certain statistics, criteria and indicators which can display a society's health level. For example, the rate of baby mortality, rate of mother birth, rate of parental mortality, total fertility rate, population per doctor, population per bed, etc. by using these indicators. The society's health situation can be followed, the effectiveness of programs which are conducted can be measured, possible needs can be determined for health services and the society's health level can be compared with the health level of other societies or countries. The BHSM software has a great importance as it provides such inputs.

The BHSM software consists of two main modules working at Provincial Health Directorates and our Ministry.

• BHSM/PHD (Provincial Health Directorate Module)

• BHSM/MoH (Ministry of Health Module)

The aim of the BHSM/PHD module is to enter the statistical data which was reported from the field to PHD s (village clinics, hospitals, outpatient clinics, etc.), carry out controls of correctness and consistency, receive the sums of provinces and produce the provincial health indicators in the form of reports.

The aim of the BHSM/MoH module is to control the unity and consistency of data entered from the PHD s, provide consolidation at the country level, calculate the sums of country and produce the country health indicators in the form of reports.

Certain Report Titles in Program
1- Demographical Reports

• Population's Age Groups and Distribution according to Sex

• Population's Education level and Distribution according to, Sex

• Approximate Birth and General Fertility Rate

• Special Mortality Rates and Approximate Mortality Rate

2- Bed Situation Reports

• Actual Bed Numbers in Hospital

• Distribution of Beds to Services at Inpatient Treatment Institutions

• Actual Occupancy Rate per Bed at Inpatient Treatment Institutions

• Bed Transfer Rates at Inpatient Treatment Institutions

3- Hospital Services Reports

• Report on Average Duration of Stay at Inpatient Treatment

• Institutions according to Diseases

• Rate of Application to Inpatient Treatment Institutions according to Diseases

• Inpatients and Outpatients

• Situation of Blood Supply

• Situation of Blood Consumption (Unit)

4- Mother Mortality and Monitoring Reports

• Miscarriage rates

• Maternal Mortalities

5- Baby and Child Monitoring Reports

• Baby and Child Monitoring Reports

• Baby Mortalities

6- Disease Reports

• Distribution of Patients' Morbidity/Mortality Rates to Years

• Distribution of Patients' Morbidity/Mortality Rates to Months

• Inpatient Treatment Institutions Disease Statistics Report

7- Immunization Reports

• Numbers and Rates of Diphtheria Whooping Cough Tetanus- Vaccination – According to Years

• Numbers and Rates of Polio- Vaccination – According to Years

• Numbers and Rates of Measles Vaccination – According to Years

8- Environmental Health Reports

• Control of Drinkable and Usable Water

• Control of Brook, River, Lake, Pond, Swimming Pool, etc.

• Water Report

• Fresh Water Analysis Report

• Nutriment Analysis in Public Health Laboratory

• Water Control of Stream, River, Ocean, Lake, Pond etc.

9- Village Clinic Work Reports

• Form 024 Pregnant-Baby Situations

• Form 024 Policlinic-Laboratories Track Numbers

• Form 024 Polyclinic and Laboratory Work Rates

• Form 024 Other Services Report

10- Reports of Combating Tuberculosis

• Number of Tuberculosis Patients and Tuberculosis Incidence

• Treatments with Contacts at Dispensaries and Those Protected with Medicine
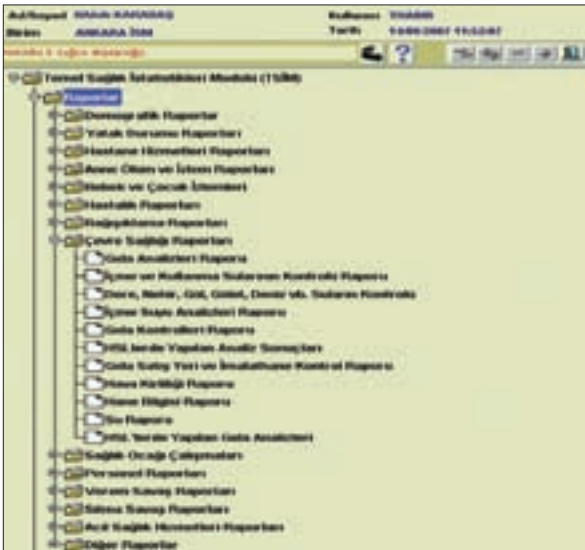
• Treatment and the BCG Work at Dispensers of Combating Tuberculosis

11- Reports of Combating Malaria

• Classification of Malaria Cases

• Blood and Case Distribution of Malaria Control Work to Years

12- Other Reports

Forms within the Program

1- Distribution of Population to Age Groups, Sex and Settlements

2- Vaccination Results Scheme

3- F013/B Private Doctor Vaccination Applications

4- First Level Monthly Work Declaration

5- Mental Diseases Information Form

6- Monthly Malaria Reports

7- Combating Malaria Laboratory Monthly Report

8- Disease Statistics Form (Except those to be informed)

9- Diseases to be Informed Form

10- Monthly GBP Surveillance Form

11- Rabies Suspected Contact Surveillance Form

12- Public Health Laboratory studies

13- Form of Spring Water

14- Water Surveillance Form

15- Report of Death and Illness Occurring From Overtemp

16- Mother Child Health Program studies

17-Family Planning studies

18- Provincial Report of Mother Death

19- Air Pollution Measurement Results

20- 15-49 Age Female Information Form

21- Trahom studies Form

22-VSD-17 Monthly Activity Report

23- Dispenser of Combating Tuberculosis Monthly Activity Report

24- Declaration of Urgent Aid and Rescue Work

25- Laboratory studies Form

26- Monthly Blood Works Report

27- Personnel, Patient and Bed Balance Form

28- Dialyze Information Form

29- Disease Statistics Form (for formal and pay hospitals)

30- Mouth and Tooth Health studies Form

31- HIV Test Results

32- Weekly Surveillance Report of Water And Nutrient Contagious Diseases

Accounting Information System (AIS)

Circulating capital processes were provided with automation

"Accounting Regulation on Managements with Circulating capital" was published on the Official Gazette dated June 13, 1999 and numbered 23724 and came into the force.

According to the temporary 2nd article which was added to the law numbered 209 with the 3rd article of the law numbered 4618 and Additional Article No 2 which was added with the 2nd article of the same law, the "Health Institutions Circulating Capital Accountancies" covering such treatment institutions and organizations as the village clinic, dispenser and state hospital was established in order to conduct circulating capital services in accordance with the Ministry's approval dated 05.09.2001.

It was planned to use a standard AIS at 214 Circulating Capital Accountancy (CCA) which carries out accountancy services of health institutions attached to our Ministry since the year 2004. It was decided to use the Accounting Information System (AIS) Application Software which was developed by the Department of Information Processing with the coordination of Circulating Capital Management of under the Department of Strategy Development. It became possible to keep the financial information and tables in a standard way and monitoring the information which are kept on a central database both from the managements and the Ministry.

AIS was designed, developed and put into

practice in a structure which operates under the systems of our Ministry's center and the users can reach the system from Internet.

Aim

Providing the use of a standard single accounting program at Circulating Capital Accountancies of Health Institutions which are attached to our Ministry.

Goals

• In the scope of circulating capital accountancies, keeping single order accounting records and information of the institutions which are attached to our Ministry with a standard software,

• Providing all the circulating capital accountancies with the opportunity of using a standard account and budget and carrying out standard reports and standard processes and keeping the data, information and reports in a correct, comprehensive and current situation,

• Monitoring the financial situation of institutions which are bound to circulating capital accountancies from the center correctly, comprehensively and in time,

• Ensuring the effective and rapid use of the by monitoring and reporting bound institutions' budget movements, revenues and expenses correctly and on time,

• Monitoring and reporting the accounting records produced by all the circulating capital accountancies at the Ministry's center within a consolidated accounting plan,

• Providing decision makers with correct and current data and information in establishing and applying national health policies.

Benefits of the Use of Uniform Accounting System

• Officials of our Ministry and Finance Ministry can immediately reach the financial information in the desired scale which is appropriate to the criteria they requested.

• It's possible to receive information on the financial situation on the unit basis.

• It's possible to carry out financial situation analyses on the basis of province,   region and country.

• The situation of a single account or a sub account can be seen immediately on the   basis of province, region and country.

• Information on the situation of budget of the current year can be obtained in different periods of time and different parameters can be analyzed.

• Year-end transactions can be carried out easily and many facilities can be provided in planning the next year's budget.

• Other Financial tables like Payables Receivables, Income-Expense, Balance Sheet,

Balance, etc. can be monitored on the basis of Hospital, Circulating Capital Accountancies and Turkey.

• Information on currents of the institution can be received and the institution's accounts can be examined on the bank basis. Receivables from the institutions can be followed collectively and on the basis of invoice on the current system.

With the use of a standard software owned by our Ministry;

• Database management system license costs, on which the Single Order Accounting System Application Software would work, were decreased.

• Standardization was ensured in producing and reporting the information.

• Services of software update, technical support, maintenance and training were supplied with low costs.

Performed Works

• Forge the software to produce standard information, institution codes which were prepared by the Turkish Republic's Prime Ministry were benefited in coding the institutions who receive and present service so the software can produce standard information.

• A participant from each Circulating Capital Accountancies was given the "uniform accounting and program usage training" between November 3 and December 26.

• As a result of the trainings the lacking sides and the defects of the program were

determined and the uniform accounting program was rewritten and adopted to the Internet in accordance with circulating capital accountancies' views and suggestions.

• Accountancy officials from all Health Institutions Circulating Capital Accountancies were given practical training concerning the solution of frequently observed problems the use of the Accounting Information System (AIS) Program that is utilized at Health Institutions Circulating Capital Accountancies conducted by the Chairmanship of Department of Information Processing and Chairmanship of Department of Strategy Development.

Patient Surveillance System (PSS)

The Patient Surveillance System (PSS) was developed upon the request of the Office of Government Doctor in order to keep the records of health service which is furnished for the personnel working at our Ministry's Central Organization and the people whom the personnel is responsible for taking care of at our Ministry's Office of Government Doctor and provide a patient-oriented and rapid service of good quality and it was started to be used as of 02.01.2004 following a trial period of 3 months.

This system which has started to operate at the Office of Government Doctor enabled possibility of establishing service receivers' Personal Health Records. In the light of this project, a structure which can be helpful in determining the context of Personal Health Record on the national level has emerged.

The study aimed to establish an experimental work atmosphere which will form a resource for the Primary Health Care that are based on the Family Physicians. Thus, a great many experience was obtained in many fields, including the design of screens to be used by Family Physician Application and the information to be put on the health registration database.

In the PSS project, it's also possible to carry out the personnel performance evaluation in terms of the circulating capital payments based on the performance.

Users' roles which were defined in the PSS were determined in accordance with the work flow at the Office of Government Doctor and the role of the personnel in duty, and the users of the system were classified as Physician, Nurse, Registration and Admission, Laboratory Worker and Dentist.

Examination Screen

Electronic health record for Ministry's central organization personnel

• Keeps the records of health service which is given by our Ministry's Office of Government Doctor to the Ministry's Central Organization personnel and the persons whom the people is responsible for taking care of,

• Establishes the detailed health record of people receiving the service,

- Personal Characteristic - Parenting characteristic
- Chronic diseases, the medicines being used
- Treatment information
- Requests of examination
- Information on sending to the higher institution
- Prescription information
- Approvals of glasses
- Report information

• Monitors and evaluates regularly the people who receive service by detailed health records.

Views on Health Services

Our Ministry's Departments or other Public Institutions are often ask many questions to Ministry of Health of Department of Curative Services on their work fields and relevant health services. Since nearly all these views are the same but their institutions are different, the correspondence increases causing the increase in daily work load and information on the views

which are given to institutions can't be obtained. Therefore, a web-based central system, which will ensure the Institutions' share of information, was established in the work which was jointly carried out by Ministry of Health of Department of Curative Services and the Department of Information Processing.

An interrogation can be made with the titles which were formed in the system and it can be listed. The views concerning the listed results can be viewed as a text.

The operation of the system is carried out completely on the web. The Department of Curative Services records the views from the system's management screen in the database. The screen of interrogation and the list of results were opened to our Institutions and the Public with a link put on the Ministry of Health's Official Web Page.

Medical Device and Material Record System (MDMRS)

The Global Medical Devices Nomenclature

(GMDN), which was supplied by the Ministry and translated into Turkish in order to establish the database of medical device, consumption materials, laboratory tools and kits, was used and a new "Database of Medical Device, Consumption Material, Laboratory Tools and Kits" has been established in the context of a protocol signed between the Ministry of Health and the Health Industry Employers' Association (SEIS) to cover the product brand and model for our country as a part of a new algorithm system of coding and numbering. Record input/update processes are underway.

In order to establish the Medical Device, Consumption Materials, Laboratory Tools and Kits Registration System; this developed pro-gram covers the following information on the medical firms (except the medicine and fixtures) which supplies materials as the manufacturer, importer and dealer with in the context of the Medical Device Regulation, Regulation on Active Medical Devices Placeable on Body and the Regulation on Medical Diagnosis Materials not Used for the Body;

• Address, phone, fax, e-mail information,

• Tax registration, trade register information,

• Quality system document information,

• Branch information,

• Dealer information,

• Product information with coded manufacturer, importer or dealer,

• Registration information of these products like the institution delivering CE

documents, date and number of delivery,

• Quality system document belonging to manufacturers.

The information of 1.590 firms and 148.884 the medical devices on database were entered as from 04.10.2006 and data input/ update is still underway.

According to protocol between Social Security Agency and Ministry of Health signed in 04.07.2007, data matching studies started on Device and Supplies for National Medical Device and Information Bank.

Ministry of Health of Tender Information System (MOHTIS)

Tender results concerning the material and service purchase can be entered on the spot in terms of the principle of transparency by the software of web-based application which was developed by Provincial Health Directorates, all the Hospitals and Regional Directorates of Hygiene which are bound to our Ministry and Department of Information Processing. Thus, extreme price differences between tender prices can be removed and realistic prices can

be reached   more rapidly in determining the approximate cost.

MoHTIS is conducted under the coordination of Chairmanship of Department of Information Processing, with the Chairmanship of Department of Strategy Development and General Directorate of Curative Services of Ministry of Health.

A system was established which the results of the institutions of Ministry's (Provincial Health Directorates, Hospitals and Hıfzıssıhha Regional Organizations) tenders of supplying cleansing, food, medicine, medical consumption material, medical device, fixtures and tool in return for kits can be transferred to the "tender information system" by relevant institutions and tenders' results can also be monitored by the center and institutions by this system.

While entering the results concerning the medicine tenders, the medicines' names are chosen from the medicine database which are present at the central database and consist of the ATC (Anatomic, Therapeutic, Chemical Classification System) codes as well.

The work on establishing the titles which will be used in relation with tenders of supplying medical consumption materials, medical device, fixtures and supplying tools in return for kits by benefiting from the Global Medical Devices Nomenclature (GMDN) coding system is underway. When the mentioned database is ready, it will be used in the tender information system.

The Tender Information System was opened for usage as of 01.09.2004.

Tender results of health institutions which are bound to our Ministry can be monitored according to the fields of information which were chosen on the basis of Health Institution, Province and the entire Turkey by the report program which was developed from the data formed at the database in the center.

On the other hand, the results of inquiry which are displayed on the screen in the Report part can be viewed on the web page and can also be transferred to Microsoft Excel and saved on personal computers, if desired.

Performance Surveillance System (PSS)

The aim of this system is to collect data and information about implementation enclosed by Regulations related to working capital income given to salaried staff at Ministry of Health in Turkey" from the whole health enterprise. As a result of examining data and information by Analysis and Efficiency Branch, analysis will occur which is leading strategies enchanced by Ministry of Health.

PSS has a hierarchical menu composed of two major fields and related minor fields.

Accessible benefits of these major and minor fields are determined and it is impossible to access the parts by an unauthorized.

Six minor fields in Data Entry as following:

1-Log in and password entry page

2-General data entry page

3-Branch data entry page

4-Personnel data entry page

5-Administrator data entry page

6-Confirmation data entry page
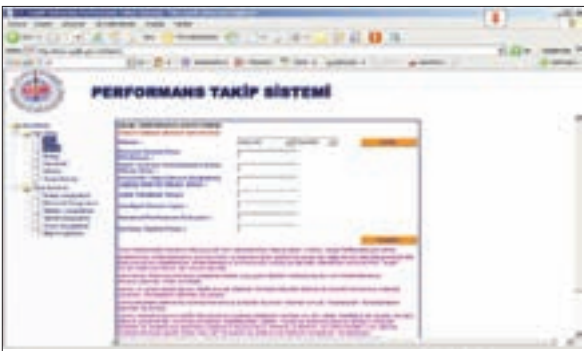
After the data entry started (date: 06/09/2007),"Branch Form" 169.753 registries found in the database. Accuracy and consistency analysis shows that our associations understand the importance of system and data are mostly correct.

Decision Support System (DSS)

DSS has been formed by using the data collected according to the specified standards since beginning of the 2007. In order to take decision more accurately and fast during the Management Decision Support phase, a web based "Oracle Business Intelligence" reporting

system which provides collection of data, storage, analyze, easy access and planning with them, as well specifying the strategy has been formed within the our Ministry.
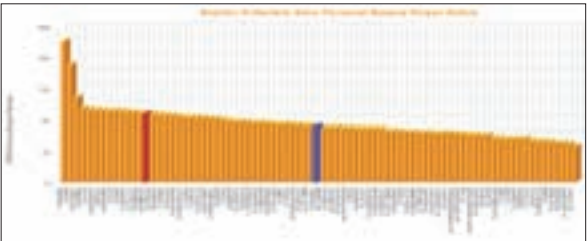
a) Health Personnel Reports:

System has been formed by using the data belongs to a day before within the CHRMS/HRMS that is used for the personnel management for both Central of MOH and its Provinces

Oracle Business Intelligence reporting screen

Physician number per 100.000 population

b) Family Physician Information system Reports:

The current information regarding health has been prepared in order to be analyzed by responsible units in our ministry and provinces. By this mean, right investments and better services has been aimed

Reports regarding Turkey's health profile from Family Physician application ensure the decision makers allocate the resources efficiently.

Our Ministry measures his performance by using the Performance reports among the Family Physician reports in order to take necessary action to deliver the better health services.
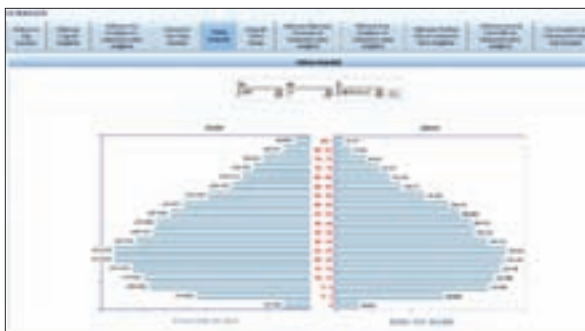
Data from the other Health Informatic projects shall be transferred (for example; Basic Health Statistisc Module, New performance Monitoring System, Patient Rights Information System, etc.)

Geographical Information System (GIS)

This is an application integrated with the MapInfo which is an open and international software of geographical information system and which can be integrated with the Core Resource Management System (CRMS) and other systems in order to process certain institutions which are attached to our Ministry like hospitals, village clinic and health house on the map, carry out geographical and non-geographical inquiries and analyses on the basis of region, province, district and unit and use the map and geographical information in the restructuring easily. With this program,

• Print-outs of health institutions' locations and health equipment on the basis of province

and district can be taken at the preferred page size.

• In cases where the institutions' personnel or investment planning depends on demographic and geographic values, the geographical information system is used for healthy analyses.

• Statistics which depend on the numeric criteria like the population per doctor and the population per bed can be viewed on the screen easily by colorful mapping.

• The closest first and second degree health institutions to the point which is clicked on the screen can be displayed on the screen.

• The shortest way between the two points can be calculated with the alternative of finding shortcut and can be displayed on the screen.

• The organization's data is displayed on the geographical and demographic data on issues of investment planning, urgent action plans or the distribution of personnel and thus correct analyses can be made.
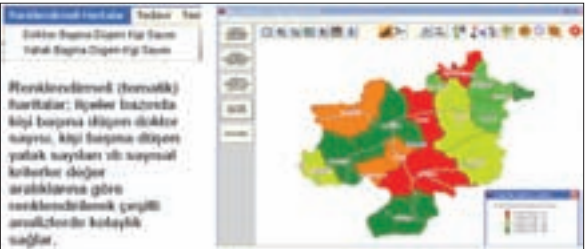
• CRMS Integration: The Core Resource Management System which belongs to the Ministry of Health and which is operating at the moment, provides the opportunity of viewing the personnel working for health institutions in an updated way. The Geographical Information System can import the data currently from the

CRMS database thanks to the MapInfo-Oracle NATIVE connection.

• Information on project investments can be displayed and questioned according to categories on the current map.

Health Geographical Information System interface

Our goal is to integrate the Core Resource Management System (CRMS) project starting from HRMC module and later on all the other health informatics projects as basic health statistics module (BHSM), Patient Rights Information System (PRIS), The Performance Surveillance System (PSS).