> SECOND DAY / FIRST SESSION

PRESENTER- Good morning dear guests. Welcome to the second day of the our symposium on the Applications of the Electronic Health and E-Prescription. Mr. Murat Güler, from the Department of Information Processing of the Ministry of Health is going to contribute our symposium with his presentation.

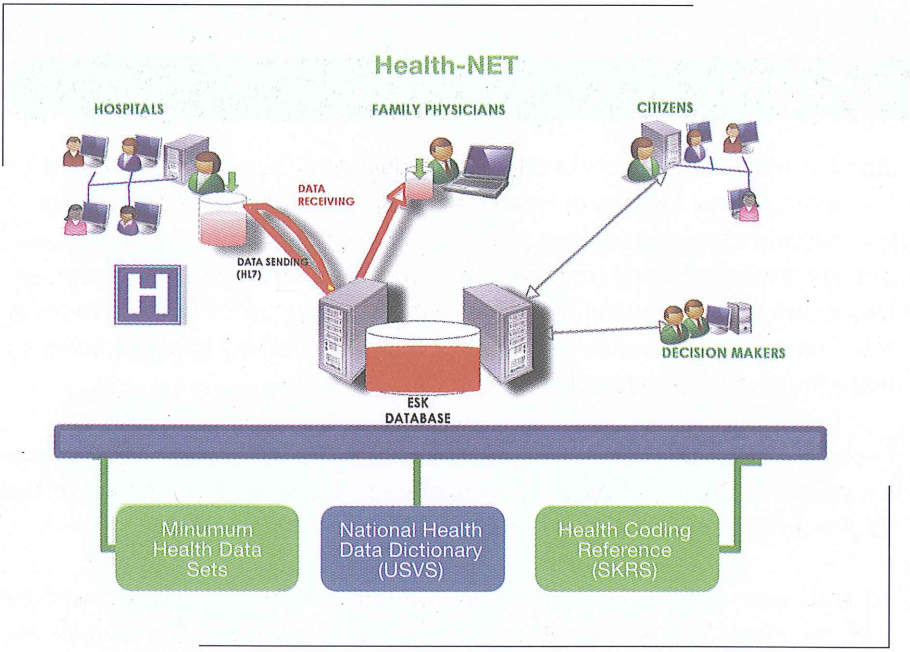
MURAT GÜREL

Good morning everybody. I work as a consultant at the Department of Information Processing of the Ministry of Health. Actually, the the Head of Department of Information Processing Dr. Ünal (HÜLÜR) was supposed to present this speech but he cannot do it as he has to attend to another program outside Ankara. So, I will make the presentation. Thank you for gathering here for listening to me in this cold day of Ankara. We have foreign guests so I will try to speak slowly to make the translation easier.

I will try to introduce the National Information System in other words the information system that we labelled as the Health-Net. Firts of all, I would like to give an idea about the conceptual foundations of the Health Net.

What is Health-Net? Health-Net is a platform that collects all kind of data directly from the health institutions where they are produced in compliance with the standarts and brings into the use of all stakeholders. Before, not data but information was being collected in the systems used by the Ministry of Health. This information was being sent to the provincial health directories by the health institutions after being collected as either hardcopy or softcopy. Provincial health directories were sending all collected data to the Ministry of Health. It was very hard to make new calculations with or verify the accuracy of the collected information as it was not data but just information flow. The Health-Net is a system that was established to solve this problem and collect data directly from the field.

When you want to collect data from the field, the biggest problem is to collect all data in a certain standard. You face a great confusion in the center when the data in the units of the field do not send data in a certain standard way. What you see in the middle of the slide is the electronic health record database. The two most profound agents that foster the database are hospitals and family physicians. Citizens and the decision makers are the actors who use the information on the database for data share.



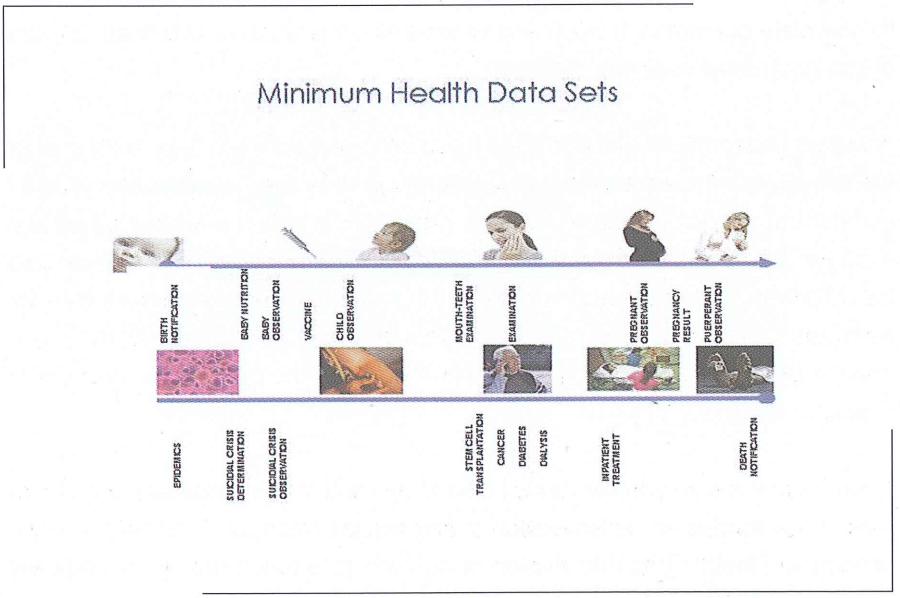
The data sent by hospitals and family physicians flows over three main standards as you see over there. These are Minimum Health Data Sets, National Health Data Dictionary and Health Coding Reference Server. Let's take a brief look these standards.

In advance of the standards we should answer why we need these standartds? As I have already said, it is impossible to manage the data in the center if it is not sent according to certain standards from the field. As seen on the picture,

there are different units having different characteristics and colours in the field. It is very difficult to form a meaningful data unity by gathering them together. We have to bring standards for them, otherwise the result does not emerge as a meaningful unity.

Our aim in bringing standards is to make a meaningful sound. A hospital and a family physician can send data but both of them should play the note do when we ask them to play the note do in order the data to be saved in our database meaningfully according to certain standards. Thus, we will be able to process the data as desired.

What are our standards? Let's start with minimum health data sets. Minimum health data sets mean the data groups collected from the field. We call it "minimum" because collecting data from the field is a hard work. As you know, the field is not ambitious to send data. This is why we call it minimum. Currently, there are 46 minimum health data sets in the system.



Here you see some cardinal ones.

These data sets form the basic health records from birth to death. For example, birth notification, infant nutrition data set, infant observation data set, vaccine data set, mouth and teeth examination, examination, pregnant observation, result of pregnancy, puerperal observation, data of epidemic disease, attempted suicide and crisis notification, determination and observation of drug addiction, data of organ or stem cell transplantation, chronical diseases such as cancer, diabetes and dialysis, use of inpatient services and death notification.

At the moment, a work is being carried out on the Health-Net only to collect the health data. Nevertheless, data sets are not limited with the health data sets. As I said before, we have 46 health data sets. These sets have the purpose of collecting the data of the citizens' health from birth to death. However, in order to be able to make things work in the ministries, that is to make appropriate plans, also administrative and financial data sets have to be collected. We aim to complete our works in 2009 and receive all administrative and financial data of the institutions over this platform.

The data sets imply the kind of data to be collected from the field. How should we standartize the data elements inside these data sets to make everyone to understand the same note. In fact, we needed to conduct a kind of schematic work for that. In order to reach the correct information of the field, data should be collected. The information of "five" alone does not mean anything but, for example, if it is the number of the children a pregnant patient gave birth to, you make it an information by relating it with the age of the patient, the number of miscarriages.

If you have the data you can build new models with this information. When you build these models an accumulation of information emerges in the center of the Ministry of Health. This information brings you to a result that is strategically

important for the administration through new models. Actually, what is aimed here is this; if we look within the frame of the logic of quality, you have to make assessments and measurements if you want to administer something. You cannot administer something if you cannot measure it. If you measure the number of polyclinics which is 100 thousand in February and 120 thousand in March you can see the increase in the number of polyclinics. It means that you cannot administer if you cannot see the increase or decrease in the values of the elements you are trying to administrate. Therefore, you shold be able to make measurements in order to administrate something. In order to be able to make measurements you need to classify the elements in meaningful groups. In other words, you should not confuse the apples with pears. In order to be able to make classifications, you need to put the definitions. National Health Data Dictionary is used for defining and classifying the elements. National Health Data Dictionary explains in detail what we should collect as data from the field, what the logical framework of this data is, what the technical framework is, which answers turn into values.

We analysed the other examples in the world while preparing our dictionary. The example of Australia is prominent in this area but it is also possible to find the example of Palestine or New Zealand. What is the content of the dictionary? As an example, it should send the vaccine data packet before the vaccine notification. This is only one of our data packets. We have two data sets in this packet. First is the data set that shows citizen's registry identity information and the second one shows the data concerning vaccine. These data sets are composed of data elements. There is information about the identity of citizen in the citizen registry while the vaccine data set shows the kind of vaccine, lot number of it and when it was used.

After the National Health Data Dictionary I would like to give information on Health Coding Reference Server. It is generally frightening to see so many different words together like here for the people encounter for the first time. I

will try to explain it in the next slide briefly in a way that you can understand it. What we have done concerning the National Health Data Dictionary can be explained as follows: there are main health values and health lists used in all over Turkey. It might be diagnosis, an ICD diagnosis, drug codes, clinical codes, list of health institutions, vaccine list or monitoring calendar. We established a server in order to enable whole Turkey and all health institutions to use the same list in a standard way. In order to overcome the confusion we have tried to make everyone to give standard answers. You will understand this more clearly in my next example.

Finally, the Ministry of Health and the health institutions in the field will communicate over the same database. We send the minimum health data sets to the field as if they are boxes and wanted them to be filled. These boxes imply the kind of the data we want. We have 46 boxes at the moment. Dates of the data define the materials to be put in a box. We also define the correct material or a material that includes what I want. We also define it in the National Health Data Dictionary. We have 261 data elements like this.

What is the Health Coding Reference Server (HCRS) used for? You all face an unfortunate moment when you go to a market. For example, you buy a product that does not have a barcode on it or a product that has the barcode which cannot be read by the system at the counter. The product cannot be identified at the counter. What does it mean? It cannot be identified because it was not defined in its system. This is the function of the Health Coding Reference Server. When I want the server to send several data it sends exactly what I want because I already defined what it should send. I have lists that I put in the Health Coding Reference Server. I put another list that fixes how to assess the answers. It should answer the questions according to tables in the list. Otherwise, I cannot read the barcode of the data and cannot put on the related shelf of the database of the ministry.

As a result, after putting these standards, the health institution realizes the integration over its own information system. It revises its system according to these standarts, packages its data and sends it to the Ministry of Health in certain periods by using HL7 technical standards. The Ministry of Health checks out the inbound packet according to its own standards to see whether it is consistent with the data set template it sent and whether the data elements are as wanted. Or whether the answer value returned in accordance with the HCRS or so-called barcode system. If all three of the questions are okay then it writes it in the database. If there is any error it replies about it.

Let's take a scenario in order to understand the integration of the Health-Net. Think of a patient named Ahmet Yılmaz. When he applies to the hospital his identity information and the fact that he applies on 20 October 2008 are recorded. Afterwards, he is examined. The name of the physician is Mehmet Hekimoğlu. Mr. Hekimoğlu wants him to have a blood test. The patient goes to a laboratory in the hospital or outside the hospital. He has the test. The physician directly sees the test result if the hospital is an integrated one but the patient brings it to the physician if it is not an integrated one. After the examination, the physician gets a diagnosis and writes a prescription. The patient gets his drugs from a pharmacy. What is the ordinary thing here? The ordinary thing is that Ahmet Yılmaz goes to hospital. His identity information is written in our citizen registry data set. After he is accepted to the hospital, the data about the way and date he comes to the hospital, the polyclinic he goes to are recorded. The patient is examined by the physician. The physician listens to the patients complaints and writes the necessary tests. The tests are completed and the results are written. The prescriptions of the patient are written in the prescription data set and then the patient leaves the hospital, he leaves the hospital with some treatment suggestions. How the patient left the hospital, whether transferred to another hospital or left the hospital are written in the exit data set. Afterwards, this data is divided into groups. Actually, what you see at the left hand side (below) are the list of these.

Citizen/Foreigner Registry MHDS

Name and Surmane of the Patient: Ahmet Yılmaz

ID Number:12345678905

Patient Acceptance MHDS

Date of Acceptance: 20 October 2008 Monday 09:30

Examination MHDS

Physician: Mehmet Hekimoğlu

Complaint of the Patient: Lack of appetite

Requested Inquiry: Blood Test

Main diagnosis: Anemia

Inquiry Result MHDS

Inquiry: Blood Test

Date of Inquiry Result: 20 October 2008 Monday 10:30

Prescription MHDS

Medicine: Drug Iron Deficiency Anemia

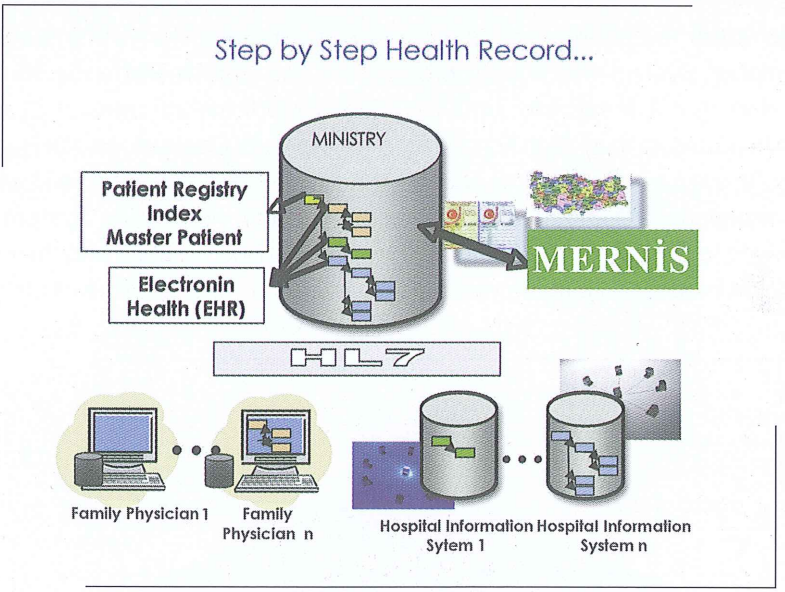
Dosage: Twice a day

Patient Discharge MHDS

Discharge Date: 20 October 2008 Monday 11:30

Type of Discharge: Discharge upon treatment recommendations

This table, after being read from the databases, is transformed into a form that the computer can understand, in other words into an automatic message by the information systems. Hospital information management system gets the information of Ahmet Yılmaz from its own database and transforms it into a HL7 message as I have shown above. The HL7 message is sent to the ministry. The ministry opens the sent packet and writes it to its own database. So, the Ministry of Health collects data in this way from all the main agents in the field such as state hospital, family physician, private hospital, university hospital. In fact, this is the logic that forms the **Electronic Health Record**.

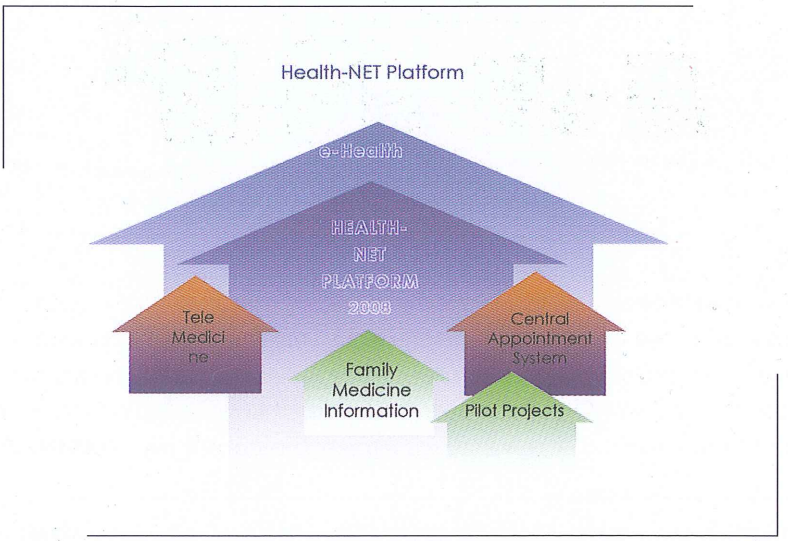


Here you see a simple example. Family physician sends a patient record to the Ministry. Suppose the following as family physicians: first family physician and second family physician. And suppose a hospital number one and another one number 50. The family physician sends the information of the patient's health registry to the ministry. The Ministry searches the patient over **MERNİS**[6] and

6 Merkezi Nüfus İdaresi Sistemi (Central Population Management System). For detailed information see, http://www.nvi.gov.tr/Hakkimizda/Projeler,Spot_Mernis.html

opens the record of him. After opening the record, a patient registry index is formed and the **Electronic Helath Record** of the patient is written on that index. When this patient goes to another hospital, the data recorded in that hospital is added to that index through the citizen identity number. If he goes to another hospital again, the records are combined and by this way the **Electronic Health Record** of a citizen is formed.

After analysis of the conceptual part, let us go into the technical details of the **Health-Net** as a platform. The **Health-Net** is in fact an application that we have developed under the e-health platform. We initiated the e-health with the Family Medicine Information System in 2005. In fact, the Family Medicine Information System was a small prototype of the **Health-Net** application we are carrying out today. More than 20 Family Medicine Information Systems operate and more than 12 million persons have already Electronic Health Records today. This is a small part of the **Health-Net**, which has already been successed. The experiences gained with the Family Medicine Information System was conveyed to the Health-Net Platform that we established in 2008 and the Family Medicine Information System was made operative on the **Health-Net** platform.



I am talking about the **Health-Net** but I am touching on our other projects under the Health-Net in order to show their relationships between the e-health. For example, the **Tele-Medicine** is also a e-health project. It operates on this platform. We have **Central Hospital Appointment System** that will come into force in 2009 as a pilot project. Before applying to the hospital, the patients will get appointment by phone. This project is being carried out in integration with the **Health-Net** platform besides our other projects. The other projects can be listed as the applications of Smart Card, mobile signature, e-prescription who will be explained by Sami KIRAÇLI[7] in the afternoon.

What is the basic information about the **Health-Net**? The Health-Net is a platform established to collect all kind of data needed by our Ministry in certain periods from the field. It would enable us to collect the health data of the citizens and administrative and financial data of the institutions. Data will be collected directly from the place in which they are produced and sent monthly, weekly and daily by the health institutions. The received data, after being analysed and reported in a required way, will be opened to the use of everybody. The aim of this project is to build the **Electronic Health Record** database. There has not been electronic records of the Turkish citizens so we want to have one. The tender cost of the project is 2,4 million dollars. When we compare the project with the other national and international examples, we see that it is one of the biggest projects of Tukey in terms of the numbers of web services. The successful e-health applications in Europe serve for small populations as they are applied in small countries like Scandinavian countries or provinces of bigger countries. We almost cannot find successful examples in countries having population of 60-70 million like Turkey. As eveybody knows, Great Britain has a grand project in this area. It is said the 12.7 billion Sterlings have been spent on the project and there are still objections against it. It is structurally different than ours. They are changing the whole infrastructure whereas we just bring standards but do not intervene in the field that will have to integrate to our system. Lastly, I would like to say that the first and only health project that uses HL7 V.3 standard is the **Health-Net.**

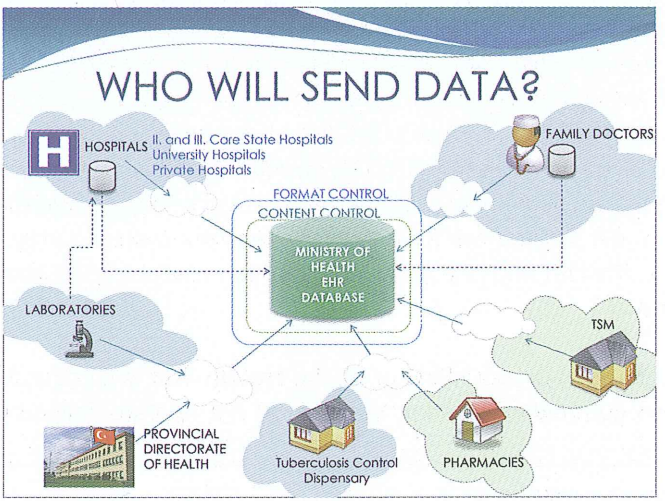
How will be the data sent? First of all, the **Health-Net** is a notification system. It is not an automation system, thus we do not operate online but offline. It

7 from Social Security Institution

means that the examination data will be sent to us everyday but we will not intervene in the operation of the sender institution such as the provision system (Prescription Confirmation System) of the Social Security Institution. So, a health institution will be able to access the information gathered during the whole day whenever it wants. The examination data will be sent on a daily basis while the other monitoring data will be sent in the related month. The data will be collected according to the HL7 which is an international health messaging standart.

What are the difficulties in data sending? Firstly, the volume of the data might be huge due to the number of examinations in polyclinics in our hospitals. Our human resources capacity is sometimes very limited to handle the data. Our technical capacity is limited due to HL-7 messaging standart. These are the limitations. We have organized many trainings to overcome these limitations. We organized basic Health-Net trainings to our health institutions. We also gave technical trainings to the software companies on how to conduct messaging accroding to HL7 standarts. We have provided trainings for 2 thousand 224 persons in total. In addtion, we are going to organize a workshop for the companies on both Friday, Saturday and Sunday to solve the techical problems regarding to the HL7.

Before summing up, let me say a few things on the agents and reportings in the **Health-Net.** The first agents are the hospitals and the family physicians.



We are not planning to collect data from the health centers in the first step at the moment because they are being transforming into family medicine. We do not want to bring a structural change in health centers during this transformation process. In addition, there are laboratories inside or outside the hospitals. It should be mentioned that this base is built to be able to communicate with the main agents, that are the hospitals and family physicians, over the system databases. It is also designed to make other units, such as combating malaria, combating tuberculosis and provicial health directories, to be able to send data to us over web. The main idea is to built a communication system and form a web page on our portal for each data set to be collected from the field. Thus, any health institution will be able to send its data to us over internet. Also, the units like combating malaria, combating tuberculosis and provincial health directories will be able to send data over these internet pages.

As you see, there are Pharmacies and Community Health Centers in the background. These are the agents which are not actively involved in the system but we are planning to develop other projects that involve them in the future. Community clinics have already taken office in bringing health services where the family physicians are inadequate in several geographical points. We will initiate a software work concerning this issue most probably in the end of next year.

The sent data is reported over the support system. Our **Health-Net** portal has come into activity. We have already completed the design of 86 reports. We are able to receive these reports over the *Family Medicine Information System.*

What sort of reports will be able to send? We can give the examples of the number of polyclinics or the distribution of population in İzmir according to age and sex. We will be able to see the distribution of cancer cases, monitoring statistics of the persons who are thought to have HIV, or diarrhea cases in Polatlı district of Ankara.

Lastly, I would like to give information on the final situation and our near future plans. Our attempts to improve the project continued in 2008 and we started

the test process on 17 November. At the moment, our hospitals are sending data. Between 300 and 400 hospitals continue the test operation at the moment. Test process will end on 31 December and we aim to start collecting real data by 1 Jauary 2009. On the other hand, our project to establish an alternate of the system, in other words the disaster recovery center, in Konya is still being caried out. We are planning to put it into practice on 31 December if there is no delay.

What will happen from now on? The first thing what we are going to do is to prepare the financial and administrative data sets. We are conducting a work on fixing the data to be sent by the institutions and the contents of administrative and financial data. The health data sets will be revised. The method we are implementing here is as follows: the health data sets will be revised every year and revision of that year will be announced in June. In addition, these will be valid from 31 December 2009, in other words 6 months time will be allowed to the field for integration.

We will start to use the *Address-Based Population Register System (ABPRS).* This system is higly contested nowadays due to the elections but it is certain that we need such a system in order to administer the health data properly. In addition, it would be better that the friends carrying out this project could add the geographical codes. Every institution in Turkey needs these codes. The Ministry of Health, municipalities, Interior Ministry, Ministry of Defence, etc. need them too. Each of them is trying to conduct these codes with their budgets. However, this should be in the address-based population system. If there is the coordinate information indicating the location I, Murat Gürel, dwell in Çankaya, the integration to the geographical information system would be much more easier. We will make our system operate on the address-based population registry system.

Our pilot project called Central Hospital Appointment System will start in 2009. We also describe it as *electronic dispatch* because the family physicians will be able to get appointments from the hospitals for their patients. In this sense, 2009 will be the year during which we will collect data, so we are planning to

speed up *Data Mining* by 2010 in which the central hospital appointment system will become widespread throughout 2010.

On the other hand, *Community Health Central Information System* will be put into force but we can not specify a certain date for it. Most probably, it will be in 2010 but it might lag till 2011. As I have already said, the **Health-Net** is an offline notification system but sometimes we need an online operation for some fundamental data sets. You need to see whether another observation data was sent before. In other words, you should have notified the drug addiction in order observation information to be sent. We need online systems in some departments for a healthy auditing, which is what we aim.

I want to add one of the important parts: We are collecting data but are we going to share it? This is one of the profound problems. We are going to share some parts of the data with the family physicians but we will not share with the hospitals. We are not planning to share due to confidentiality. Ms. Songül DOĞAN is going to explain the issue of confidentiality. A hospital might ask my health records from the ministry as if I was there although I had never gone to that hospital. When we sent data to a hospital although she is not there the legal results do not seem so logical. So we need something to prove that I was at that hospital.

This thing is the smart card system. When I use my card in the hospital the Ministry of Health can share my data with that hospital.

The case is a little bit different for the family physicians. The observation, vaccine, examination data of the patient are going to be shared with the family physician for being responsible for that patient. There are projects such as smart card, e-prescription and mobile signature whose technical infrastructures are not established yet. In addition, it is not certain when they will come into force due to the realities of Turkey. We will have a better, more accurate and healthier system when the above uncertainties are averted.

Thank you very much. The program started late so let me get one or two questions or leave my place to Ms. Songül Doğan.

PRESENTER- There are few questions. Is it okay for you?

MURAT GÜREL- Yes, of course.

QUESTION- First of all, thank you very much for your presentation. You talked about vaccine data set. If you can open your slide I can show more easily on it. Parents go to the private clinics for their babies. There are free vaccines in the health clinics provided by the Ministry of Health. Do you have any plans to include the private clinics in the system in the future?

MURAT GÜREL- They will definitely be involved, we are planning it. Let me say the main approach here: As I have already told, everybody is recorded in our Health Coding Reference System. We have the records of all our institutions in this system but not private clinics. We do not have separately a number given to them in the phase of authorization. There is no well defined regulation for receiving data from private clinics. We are planning to involve them when we establish the infrastructure and finish the hospitals and family physicians, in other words complete the large part of the market.

QUESTION- You have also mentioned the private labs that are not integrated in the system. So, the same plan is at work for them as well.

MURAT GÜREL- Yes. Actually, there is such a proposal for the labs: Our labs are recorded in the system. What I want to say is that the labs can connect and sent the information of patient's diagnosis over the web because they may not have their own database.

QUESTION- You have said that the Health-Net is working offline at the moment. And you told that patient's record that is entered by a family physician in the system can be searched on MERNİS. If it is offline, how can it be possible?

MURAT GÜREL- I may have received the message yesterday. If the sent message is not confirmed by the MERNİS I am reminded. For example it says: "You have sent 30 message yesterday but the identity information of the 23th one has not confirmed by the MERNİS." This means that the family physician

will correct that patient's MERNİS information and send it again. The physician should try to reach that patient to solve the problem.

Dr. SONGÜL DOĞAN- The family physician can make an online query on MERNİS while recording the patient in the Family Medicine Information System. After recording and sending it to the center, a second check is conducted. Some family physicians directly record the information without a query on MERNIS but we check them in the center. The system operates on two sides.

MURAT GÜREL- Actually, we have published these kind of things in our work rule documents. We tell the field to send the first data after getting a confirmation from MERNİS. I do not make another query on MERNİS of the patient who is recorded in the "master patient index". I just do it during the first registry and get a confirmation from MERNİS when the information changes. Thus, it is done only in the first registry.

Prof. Dr. LEVENT ÜSTÜNES- It has been a very inspiring presentation for me. Thank you very much. I hope the ensured process would be put into practice as required so as Turkey, we can present it to the world as a succesful example. However, I have a criticism as well. A colleague of you made a nice presentation here yesterday. I brought several criticisms after his presentation. I have to repeat them here. As you have mentioned in your presentation, the family medicine system has been a pilot project for you as well. You gathered the data and have conducted the application in material respect in that project. As far as I could see, you have looked up to the implementations -not in a technical sense- predominantly in Australia and Great Britain.

Family medicine should include the pharmacies and drugs anywhere in the world. The disunity presumably may arise due to the difficulties in online working. You have not included the pharmacies and pharmacists but just thinking to include them in your near future projects. However, a gross benefit both for the state and citizens can be assured by establishing a connection in the health system. It makes an impression that leaves the pharmacy and pharmacists out of the health system. For me, this mistake should be corrected and you should give weight to this dimesion of the project. If you do not integrate the pharmacies

into the health system it will be seen as a deficiency or patch even if you are very successful. Please bear in mind that this symposium is a part of the project carried out by the Turkish Pharmacists' Association in collaboration with the European Union. The pharmacists constitute a health professional group that is the most experienced in computer today in Turkey. They are so much more experienced than the physicians about computers and they are experienced as much as the physicians in tems of collecting data from the field. They can provide valuable data in the data sets to the administrators and decision makers. I want to take attention this question again. Thank you.

MURAT GÜREL- Thank you. You are right. There is at least one point to be mentioned: First of all, this is definitely necessary in order to follow the financial issues, to prevent drug waste, to provide drugs in a controlled and healtier way. We should not overlook that the Ministry of Health wants to get the hospitals and family physicians under control first and foremost. Drug procurement comes as the second step after consolidation of the data of these groups. Existing technogical facilities direct us to the smart card and e-prescription and in any case it constitutes an upper level. We should protect the base in order to be able to build something on it. It does not mean it is not important but it needs a vision, a strategic planning and steps towards it. I guess there is no other quetions. Thank you.

PRESENTER- We are grateful to Mr. Murat Gürel for his contribution to our symposium. Now I would like to invite Dr. Songül Doğan from the Information Processing Department of the Ministry of Health to the stand for her speech on "Patient Confidentiality in Electronic Patient Records".

Dr. SONGÜL DOĞAN

I would like to salute all of you. We are thankful to the Turkish Pharmacists' Association which is one of the most important stakeholders of the health sector. We are grateful also for such an expand on and for inviting us to present our developments.

As Mr. Murat Güler has told, we have a National Health Data Dictionary that provides the basic standard for our whole work. Everything like medicine set, prescription set, tests and examination sets exists in this dictionary. We have had many workshops while defining these elements but we would certainly like to see you with us in our future workshops. We have a committee dealing with the National Health Data Dictionary. However, we are planning to update and enlarge it. We want you to be a part of this committee.

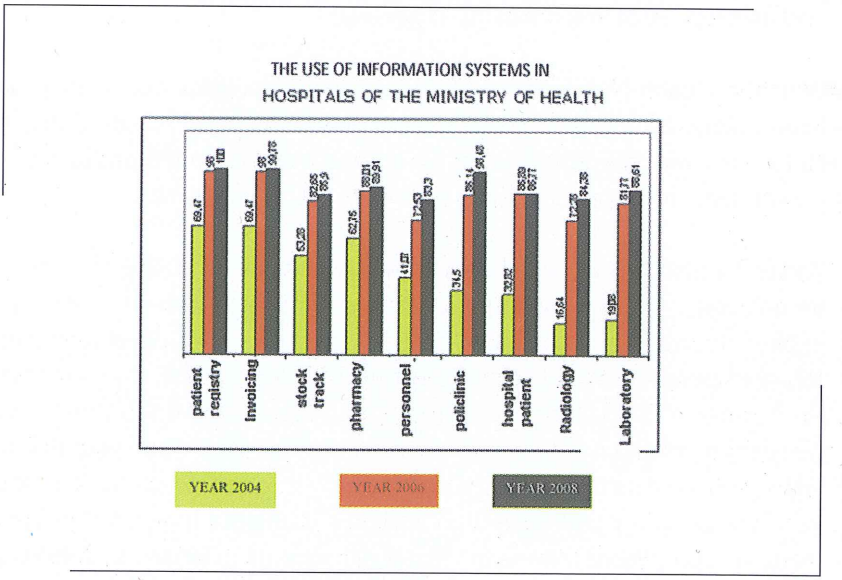
In fact, as you have seen during these two days, we are witnessing an increase in e-health applications besides many e-applications such as e-education. Data collection and transfer have become much easier with the use of the internet and developments in technology in general.

With the Health-Net process we have faced problems concerning data or information accumulation and understood that the legal aspect of the Health-Net is also very important. Thus, we started working on the protection, safety and confidentiality of health data in parallel to the Health-Net.

Today, I would like to speak shortly on our progress in using the information technologies, threats concerning safety and possible measures we can take against them, the policies that the Ministry of Health has developed, what we foresee about legislation. The family medicine application, that has started in September 2005 in Düzce, has spread to around 30 towns until now. We are planning to initiate it in three other towns until the end of the year that means within two weeks time. As you see, the family medicine application progresses very fast in Turkey and already 17 million citizens are registered in the family medicine application. This means that health records of around 17 million citizens have been formed. This is really a large number.

As Mr. Murat Güler mentioned, we will start receiving the health records from the second and third step health institutions from 01.01.2009. Actually, when we look at the statistical data we see that there were 96 million polyclinic examinations in the institutions of the Ministry of Health in 2006 and 210 million in 2007. This increase shows that we will have an unbelievable data, in other words we will be receiving the data of 210 million citizens.

Of course, we will face profound problems concerning secrecy, safety and confidentiality due to the huge amount of data. We conducted a questionaire in our hospitals in 2004, 2006 and 2008. We sent the questionaries over internet. There were questions about their current information systems and existing modules in the questionary that measure the infrastructure of the hospital information systems. When we look at the result of the questionaries, low levels of modules increased sharply in 2008. In order to show the pharmacy module I brought the data with me. Hundred percent of the hospitals under the Ministry of Health have information systems. Now we have come to the phase in which we can easily apply these information systems or the e-health.



What are the safety threats? In a survey conducted by a research group the following question was asked: "Which one of the following threats worries you in connection with the frequent use of web applications?" As you see, the conclusion is very striking: 79% is viruses and again 79% is information leakages. Besides the safety threats, internal safety threats have emerged. It was seen in this survey that one fifth of the employees have been involved in the information leakages, 90% of which have been done unintentionally. This shows us that we

have to take measeures in connection with the internal and external information leakages even if we ensure the technical safety measures.

There are three structures as safety rules. One of them are the measures taken by the administration. What are these? Existing laws, practices and procedures. You have to take physical measures that are related to the entry, exit and technical infrastructure. In other words, you have to take the physical measures in order to control the physical access to the protected data. You have to take technical measures which are valid as international standards. These are the measures which you need in preventing data leakage during the data transfer between health institutions. All the international rules are applied in the Ministry of Health at the moment. This shows us all the laws, user conventions, procedures under the same roof constitute your safety policies. I do not want to continue on this issue more. You need to take many steps in terms of techniques that you can do it easily from now on.

However, the most important thing is to take certain measures, consider some factors in order to be able to share the data with health institutions. The most well-known and simple factor is one factor identity verification system that implies username or password. The second one is two factor user verification system that is the smart card. The others are the biometric methods such as electronic signature, fingerprint, facial recognition.

How should a good safety policy be? It has to be feasible. You can develop a policy but if you do not have a structure that enables you to apply it, your policy is meaningless. It has to be comprehensible because it should appeal to all the employees. It should not only appeal to the persons who are engaged in information systems but also the health employees engaged in examination and pharmacy. The subjects should be defined clearly and correctly, and conditions regarding how to apply policies should take place. For that purpose, the Ministry of Health brought its information safety policies into existence on 7 October 2005 and sent it to all health institutions. We explained very clearly how to apply those policies, what kind of measures should be taken. It was updated within the framework of newly developed technologies and projects on 17 September

2007 and again sent to all the health institution. Different policies for our employees or administrators were handled seperately. The policies for the employees were gathered under 6 main titles as e-mail, anti-virus, web administration, internet use and general use. The number of the titles increased in Information Safety Policy for the administrators, because they have more responsibility regarding the safety of the institutions. Our subject now is the appropriate safety policy for the personal health record. We have actually defined it before. As we all know, the health records belong to the patient. They principally belong to the patient and then to the health institution. The employees, who are in charge during the patient's treatment process, should access the health records of the patient registered in their institution but they are obliged to respect the confidentiality as defined in the laws. Who can access which data with what kind of authorization should be defined clearly. This is what we call role-based approach that defines who can access which departments. The time at which an employee accesses data should also be recorded. That data can be given to the relatives of the patient but not to third persons or institutions without the consent of the patient. Most importantly, a confidentiality agreement should be made with the employees and companies who can access the critical data. As we all know, there are too many companies who work particularly for the information systems of the health institutions. Their employees work in these programs as well. First of all, a confidentiality agreement should be made with these companies.

At the current situation, a family physician can access only the data of her patients while an employee of a hospital cannot and will not be able to access the electronic health record on the Health-Net. I guess that structure will be built until the identity verification systems become widespread. Any person working at the center of the Ministry will not be able to access the health record data. Two or three factor identity verification tools are used, if a person needs to access the data will be given authorization.

There are many national and international laws and regulations that have been brought on this problem. One point is emphasized in many international regulations and practices: the countries should make regulations and laws according to

their needs. As you know, we are subjected to Turkish Penal Code (TPC). The TPC stipulates the necessary penalties for the persons who publish or broadcast the data without the consent of the patient. Nevertheless, it does not define the issue of health data. In other words, we do not have comprehensive laws that define what is health data, how to collect it, how to process it, how to share it,

Therefore, we opened that issue up to discussion in a congress organised by the Ankara Bar Association. As we all have seen, the IT specialists, lawyers and health workers should take place together in this work. Maybe I will complete the part related to health while the IT specialists will complete the technical part. The lawyers will deal with the legal issues. Thus, we thought that the three stakeholders should work together and started to work together particularly with Ankara Bar Association. We have organised two important workshops. The first one was in March, 2008 while the second one was hold on August, 2008 in which we tried to gather all the related parties. All the related institutions, particularly patient rights associations, professional associations, medicine and law departments, Turkish Medical Association, made profound contributions in those workshops. We discussed the issues in depth, in the broad sense. Who should have the right to see the data in a health institution and how should the data be sent to other institutions? Which data can be shared with those institutions? All these topics were discussed and then the conclusion report of the workshop was prepared.

As we all know, the GNAT (Grand National Assembly of Turkey) prepared the Draft Law on Protection of Personal Data which is a highly contested subject. Actually, we, as the other elated institutions, should be involved in the legal initiations on the safety and confidentiality of data. The draft law has undergone several processes since 2004 but eventually was started to be discussed at the Justice Commission. When we look over the draft law, we see that only the Article 7 of it is about the health data that is defined in very general terms. For that reason, we decided in the workshops to determine at least the areas concerning the safety and confidentiality of health data and transmit it to the GNAT. In addition, we arrived at a decision that a regulation on safety and confidentiality of the health data that is definition, registration, transfer of the

health data as well as on access to it should be prepared. We have started working on this issue.

Lastly, the articles that should be included in the draft law were determined with our legal consultants and conveyed to the related institutions. If these articles pass into law, our future legal works would lessen largely. We started working on regulation. After completion of the work on regulation we will cover all the health institutions in terms of application of health data safety policies. At the moment, only the health institutions belonging to the Ministry of Health apply these policies.

Thank you very much. I would like to answer your questions if there are any. As I said before, safety and confidentiality are important parts of the Health-Net and we would like to work together on other issues as well in the future. Thank you very much.

QUESTION- First of all, thank you very much for your presentation. It was really a nice presentation. The Ministry of Health has carried out very important projects in recent years. Many new systems designed, established and some hospitals are already using them. Confidentiality is an important issue and the primary owners of the health data are patients as you have already mentioned. Concerning the hospital dimension, I wonder how the health data was put in the system and how it was used? The Ministry of Health provides the safety policies to be applied by the hospitals but can the hospitals put these policies into practice as required? Or by whom the health data is entered in the system? By the physician or by another person? How the data is shared? Do you have a plan for establishing an internal or external auditing mechanism to control that kind of processes? I wonder about the answers of these questions.

Dr. SONGÜL DOĞAN- Thank you very much. You are absolutely right. As I have already mentioned, we communicate over the system or we make definitions in the center and then send them to the towns. We will organise a couple of workshops about the information safety policies and regulations not only in the hospitals but also in all health institutions, which also take place in our strategic

plans towards the hospitals in 2009. We have determined the concerned persons and the responsibles in all the hospitals. We have particularly determined the persons having responsibilities on the Health-Net. Those persons will also coordinate the other works in the institutions. We are going to have a workshop with those persons and we will inform at least those persons in the workshop.

There is the Patient Rights Department in the General Directorate of Treatment Services under the Ministry of Health. We are working together with them because there are several rules related to patients firstly laid down there. We are working together on the improvement of our ability as an auditing mechanism. As you know, there is only a regulation that defines the patient rights at the moment but it is on the agenda to make a law on it. We are carrying out negotiations to determine the content of the law. I do not have a clear result that I can present to you now. However, we will complete at least a part of the task concerning the law in 2009 but Mr. Gürel would add a couple of things on technical issue. Let's listen to him.

MURAT GÜREL- It is an information from outside the data processing. There is the Department of Monitoring and Assessment where field coordinators for each city are employed. Those field coordinators undertake the coordination and administration tasks between the applications of the center and field. Meetings with the JSIs were organised; trainings were provided; inspectors for quality center, quality and health were trained. 150 inspectors were provided technical and basic trainings on the above issues. At the moment, our colleagues have guidebooks explainnig the points they should inspect technically when they go to a hospital. The Ministry has taken the necessary administrative steps. This structure has the parts to be checked, but this picture needs to be clarified with the completion of the legal issues and the law on e-health. After the picture becomes clear, we will make the department of monitoring and association to add the title of informatics to their auditing criteria to be used in a standardized way during the periodical evaluation of each health institution. We are working for the purpose of ensuring such a structure.

Dr. SONGÜL DOĞAN- Is there another question?

QUESTION- Thank you for the presentation. You say that the patient track system will start within a couple of years besides information monitoring. Prof. Dr. Levent ÜSTÜNES metioned the drug track together with the patient. The other health staff will be tracked within this system as well. Thus, all kind of intentional or unintentional false applications can be followed up through this system. What are the legal measures taken about this point? Because, I believe that confidentiality is not a problem just for the patients but for the physicians and other workers of the health sector as well. My colleague made me think on that point too. Who enters the data is important with that regard. It gives us hope in one sense but it may lead some people working in the health sector to get worried about some unwanted cases. I would like to get your point of view particulary on malpractices. Thanks.

Dr. SONGÜL DOĞAN- You are definitely right. We say that we have the health records of 17 million citizens but we do not share it with anybody at the moment and do not plan to share without a legal arrangement.

This legal arrangement should of course include the health workers beside the citizens in other worlds the patients. We want to secure the health institutions at first because the persons who produce and send the data should be under security in order to get healthy data. I have mentioned regulation attempts shortly, but in fact we have defined many points who should process the data, among which health workers should the be shared. Professional associations have very interesting ideas. For example, a friend from a psychiatric association asserts that psychiatric data should only be seen by related professionals. S/he says that another physician such as an internist or pediatrist should not see it. But on the other hand, it is asserted that a medicine prescribed by a psychiatrist can influence ech other by another medicine prescribed by an internist. Thus, we say that determines the areas in which the data can be shared at least in the specific cases. It is not possible to prevent data sharing completely. As I already said, you have defined this by conducting a detailed work in each area. A pediatrist wants something while a gynecologist wants something else, but we have to find the common point that is both in favour of the physician and the patient. That is what we are trying to do in our legal works. We are trying

to put the general definitions that would not allow to harm the both sides in a conflict. Turkish Penal Code is governing this process in a very general way at the moment. There is no specific definition that indicates the deficiencies, causes or results, particularly in the protection of personal rights.

With the law on e-health, we would define all the all the points such as how to use information technologies, how to process and share the data. That is why we are going slowly. We have to hear every party's point of view. In an information system, you determine what you need and immediately write the necessary codes. But it is not like that in this case. You have to gather all the related parties together because of its being a work on law.

I do not have a very detailed information on malpractise but our legal consultancy department works on it by associating to the law on e-health. That work is going on and trying to overcome the legal problems.

QUESTION- Thanks. As a pharmacist, I would like to suggest a program about malpractice about drugs. I guess all my pharmacist friends know it and hope you know it as well: We have a program called Rx Media Pharma brought along by Prof. Levent Üstünes. All kind of communication can be seen and warnings can be sent to the physician and the patient in that program. You are not establishing an online program for monitoring but maybe you can add this one into your other programmes. We can diminish the problems gradually by this way. Because we cannot do anything in our pharmacies without that program.

Dr. SONGÜL DOĞAN- You are right, this is very important. I want to continue with an example from family medicine. We need to form the structures in which we can put those warnings and explanations that already exist in our information systems. Those are areas which are necessary for both warning and training the physicians. For example, we are conducting a work on occupational diseases nowadays. A disease should meet certain criteria in order to be called as an occupational disease. It is very easy to integrate these into information systems. If you already have these you can see the warning when it is selected among them. You see the warning and decide whether it is necesary or not. That is not

an obstacle for selection. However, there are cases preventing a selection. You can choose that one as well. All these can be done. In that sense, I definitely want to work on it.

QUESTION- I have a question that is rather related to the topic that will be discussed in the afternoon but I just want to remind the issue of drug track system in relation to the data security. You know that the drugs that will be produced and imported from 2010 onwards will be sent to the database. Even, it is said to be started in 2009. The legal regulation has been arranged in this way. Is there a legal initiative on the safety of the conveyed data? I want to learn whether it is considered too?

Dr. SONGÜL DOĞAN- Of course, it will be a legal work that includes all the applications related to health information systems. For example, it does not specify the name of any projects whether it is drug track system or the Health-Net, but it puts how the structures that would ensure the data safety, how would the data be shared, how the data would be shared with the pharmacists or drug unions. Of course, these will all be defined. Thank you very much.

PRESENTER- We are grateful to Dr. Songül DOĞAN for his contribution to our symposium. We are having a break for half an hour now and then continue again.