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TECHNICAL REPORT:

# **The Development, Implementation and Utilization of the National Health Personnel Database of Kyrgyzstan**

**Authors:**

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Greg S. Garrett, Regional Program Manager

**June 17, 2008**

**Bishkek, Kyrgyzstan**

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# **I. Acknowledgements**

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# **II. Abstract**

Integrated information systems are increasingly used to assist in the management of health human resources in high-income countries. Such systems are less frequently used in low-income and transitional countries which commonly face high levels of migration of health care workers and difficulties in training and maintaining qualified personnel. While these issues are equally prevalent in Kyrgyzstan, the MOH – with support from the USAID-funded ZdravPlus and ZdravPlusII projects – proactively developed and institutionalized, and currently utilizes, a national health personnel database to help inform strategic policy making in health human resources. This report tracks the development and utilization of the Database, describes its place as part of the wider health information system of Kyrgyzstan, and provides recommendations for improving its use thus further improving the management and long-term planning of health human resources in Kyrgyzstan.

# **III. Introduction**

Health Human Resources (HHR) are of fundamental importance to health systems as they significantly impact the quality of health services available and the health status of the wider population. Appropriate planning and management of HHR facilitates a workforce that has the right training, mix, number and distribution of health professionals in rural, semi-rural and urban locations. Developing, recruiting and maintaining a high quality workforce in the health sector continues to be one of the greatest challenges for policy makers in low-income and transitional countries. This difficulty is largely due to external and internal migration driven by domestic and international market forces. However, in addition to migration – which continues at high levels in Kyrgyzstan – other major issues that health facility administrators, professional associations, policy-makers and donors currently face in Kyrgyzstan include:

- unequal geographical allocation of resources (e.g. a lack of medical professionals in rural areas and a surplus of specialists in urban areas);
- insufficient state financing for the delivery of individual health services resulting in low quality healthcare and low salaries for health sector personnel; and
- poor education and training standards leading to a shortage of both qualified medical personnel and health facility administrators.

Successfully addressing these issues requires a comprehensive, multisectoral approach. It is clear from international best practice that effective management of HHR requires access to accurate, comparable and timely data. Both the Manas (1996-2005) and Manas Taalimi (2006-2010) National Health Care Reform Programs of Kyrgyzstan call for improving information technologies in human resources and increased capacity to strategically plan HHR. In order to implement these recommendations, address previous data gaps and improve the information base for HHR management, ZdravPlus worked with the Ministry of Health of Kyrgyzstan (MOH) from 2002 to 2006 to develop and institutionalize a national health personnel database (HPD). The goals of the HPD were to process summary data on all paid medical and nonmedical personnel working at health facilities nationwide; facilitate territorial and national comparative reporting; improve recruitment and retention processes; and strengthen internal HR management processes at primary and secondary care facilities. The HPD was developed

shortly after the adoption of the national Health Information System Concept. It was designed as an integral part of the wider Health Information System of Kyrgyzstan (HIS), and many of the standards adopted during its development have fed into the improvement of various components of the HIS.

#### **IV. The Health Information System of Kyrgyzstan**

In the early 1990s, a number of reforms were introduced in Kyrgyzstan's health sector which necessitated the development of better information systems. In 1994, the USAID ZdravReform project developed and piloted a population enrollment database to aid in the enrolment of the population at newly established Family Group Practices in Issyk-Kul Province. The database was rolled-out in 1996 to Bishkek and Chui Province under the World Bank First Health Sector Reform Project (1996-2002). In 1997, the mandatory health insurance system and new provider payment systems (PPS) were introduced. This included case-based hospital and primary health care payments. The complexity of these new systems -- coupled with increased data collection needs -- required accurate data, uniform data entry forms and timely reporting. The Automated Hospital Database and FGP Clinical Information Forms were also developed from 1994 to 1997. Additional factors such as the need for better health statistics and improved internal management within PHC practices also drove the early development of the HIS of Kyrgyzstan.

Since 1997, the MOH, the MOH IT Unit, the Mandatory Health Insurance Fund, the Republican Medical Information Center (RMIC), ZdravReform, ZdravPlus, ZdravPlusII, the World Bank, and other partner organizations and projects such as the Asian Development Bank, DFID, UNFPA and WHO gradually built up the HIS of Kyrgyzstan to incorporate new data tracking systems necessitated by the continued health reforms, trained health information users, and equipped health facilities with the necessary computer and communication equipment to run new software.

In 2000, the MOH and RMIC, with significant input from ZdravPlus, began developing the HIS Concept. As many of the HIS databases developed in the 1990s were developed using varied software packages (e.g. MS FoxPro, Access, SQL), and because a unified set of standards was not used, it became clear that a broader systematic approach was needed to further develop Kyrgyzstan's HIS. These included uniform standards and designs for tables, fields, queries, forms and reports; officially recognized reference numbers for geographic locations and health facilities; use of standards for health informatics such as HL7 and ANSI; and moving statistical data, new PPS, research data, and databases into a better more integrated, overarching system.

In November 2001, the MOH completed and adopted the HIS Concept (2001-2010) which provides the roadmap for incorporating the recommendation listed above, for further unifying the HIS and strengthening its role as an effective tool for strategic decision making.

**Text Box 1: Milestones in the Development of Kyrgyzstan's HIS**

**1994** Population Enrollment Database piloted in Issyk-Kul Province

**1997** Mandatory Health Insurance System and Provider Payment Systems introduced

**1997 - 2000** Ongoing development of different HIS databases

**2001** HIS Concept completed and adopted by the MOH

**2002 - Present** Ongoing improvements to the HIS ensuring uniformity of systems, and better data collection and reporting mechanisms

Lastly, in June 2007, WHO's Health Metrics Network completed an assessment and functional map of the HIS of Kyrgyzstan and provided recommendations for its improvement. Recommendations reiterated those of the HIS Concept and included: modify the functional hierarchy of the system; step up efforts to integrate all health facility and system databases; improve mechanisms for data collection, processing and distribution; and consolidate and reduce the total number of data forms needing completed by health facility and system personnel. The MOH IT Unit continues to implement these recommendations and the broader principles of the HIS Concept.

## V. The Development of the Health Personnel Database

In early 2002, the MOH and ZdravPlus began discussions on how a national database could help strategically plan HHR and ensure that the right types and numbers of health care providers are meeting the needs of the population of Kyrgyzstan. The objectives of the Health Personnel Database (HPD), as agreed during these early discussions, were to:

- collect and process summary data on paid medical and nonmedical personnel in state health facilities nationwide;
- facilitate territorial and national comparative reporting on HHR needs;
- improve recruitment and retention processes;
- strengthen internal HR management processes at both primary and secondary care facilities.

The HPD was the first database developed by the MOH after approval of the HIS Concept. Thus many of the principles of the Concept were incorporated during the development stages. Additionally, standards and lessons learned during the development of the Database have fed directly into the development of succeeding databases and system parts of the HIS.

Two working groups, comprised of MOH staff, IT specialists, and staff from ZdravPlus and partner projects, were formed to develop the HPD. Working Group I worked on informational content which included developing reporting forms (i.e. revising existing HHR forms and developing new and simpler HHR forms) and official reference numbers. These numbers are unique codes and titles assigned to list items used in the HPD and now used throughout the HIS (Text Box 2) (see the Annex for a sample list of reference numbers). Working group II worked on the technical design including conceptualizing the database entity relationship diagram, and designing and coding the database structure using common programs and languages (i.e. MS Access, MS SQL 2000 and VBA) thus ensuring the HPD could be used as a model for subsequent databases in the HIS of Kyrgyzstan.

### **Text Box 2: Types of official reference numbers developed for the Health Personnel Database and HIS**

- State educational institutions
- Scientific titles
- Worker status
- Government awards
- Types of personnel
- Titles of medical personnel
- Specialties of medical personnel
- Health facility structural divisions
- Managerial positions
- Health organizations and facilities
- Geographic territories

The working groups conducted their work in three phases: Phase I (March 2002 to July 2003) included: finalizing the project work plan; defining and approving reporting forms at the provincial and republican levels; systemic analysis of HHR data needing to be tracked by the system; and the development and approval of the official reference titles and numbers. Technical design and programming of the database structure and functionality was completed during Phase II (August 2003 to February 2004). Phase III (March 2004 to August 2004) included writing the user manual; installing and beta testing the HPD in two pilot facilities (Bishkek Family Medicine Center #1 and Bishkek Clinical Hospital #1); identifying ways to make the database more user friendly; correcting system bugs; and ensuring that there was sufficient capacity at the facility, provincial and national levels to institutionalize the database.

## VI. National Roll-out and Institutionalization of the Database

In accordance with HIS Concept principles, institutionalization of the HPD was completed by RMIC and the Provincial Medical Information Centers (PMIC). In September 2004, after successful completion of the Bishkek pilots, the MOH issued Decree #429 on the “Implementation of the National Health Personnel Database in Health Facilities”. RMIC and PMIC staff worked closely with ZdravPlus staff on nationwide installation and training of HHR, IT and data entry staff at state health facilities. Parallel installation and training were carried out systematically according to the sites and dates in Table 1.

**Table 1- Installation and Training**

Site	Dates
Bishkek	September-November 2004
Issyk-Kul Province	March 2005
Naryn Province	March-April 2005
Chuy Province	August-September 2005
Talas Province	September 2005
Jalalabat Province	October-November 2005
Batken Province	March 2006
Osh City and Osh Province	July 2006

A number of issues arose during installation and training which needed urgently addressed in order to ensure successful institutionalization of the HPD. These included a clear lack of interest in the database by many HHR managers; low computer literacy; insufficient availability of computer equipment; and frequent turnover of HHR managers and IT specialists leading to difficulties in building long-term, facility-level capacity.

Throughout 2006, ZdravPlus worked closely with the MOH to address these problems. Solutions implemented include:

- the provision of training sessions for HHR staff on the longer-term value of the HPD (to build interest and understanding on the importance of the Database);
- a forum for HHR and IT staff to provide feedback on how improve the HPD;
- obtaining additional computer equipment from partner donor projects; and
- the appointment of two specialists from each PIMC to provide ongoing system support to health facilities and to ensure data are being updated accurately and regularly.

Since late 2006, the Health Personnel Database has been fully institutionalized. All health facilities now operate the database independently and only require intermittent and limited assistance from PMICs and RMIC. ZdravPlusII continues to provide targeted support for trainings at select health facilities as requested by the MOH.

## VII. The Functionality of the Health Personnel Database

The Health Personnel Database is a supply-based database which tracks information on paid medical and nonmedical workers at state health facilities nationwide. HHR managers and administrators at are tasked with continually inputting up-to-date data on their personnel. The HPD is divided into

three components: 1) data entry forms, 2) a report generator, and 3) a data export and import module.

There are 14 different data entry forms in the HPD: general information (Figure 1); previous posts; current post; undergraduate and postgraduate education; categories of qualification; scientific/specialist knowledge and level; work and study tours abroad; awards; personal documents; family information; political posts held; languages; and lastly a form for any additional information. Data disclosure by personnel for input into the database is determined by Kyrgyzstan’s privacy and confidentiality policies. The Social Insurance Fund Number (SIFN), assigned by the Republican Social Fund at birth, is used as the unique identifier for each healthcare worker in the HPD (other HIS databases such as the Population Enrollment Database also use the SIFN to track individual records).

**Figure 1- Screenshot of the Data Entry Form, “General Information”**

The HPD report generator (Figure 2) provides 14 different reports on national personnel data sorted by date, province, city and facility (health facility HHR managers are able to generate these reports on facility-level personnel data only). The 14 reports are: master personnel list; medical personnel with specialization and/or retraining completed; composition of personnel by category and title; list of young specialists; composition of personnel by gender and age; list of directors and deputies; composition of personnel by ethnicity; staff with awards; composition of personnel by housing/living conditions; information on individuals recently appointed to managerial positions; composition of personnel by specialty; managers who have received disciplinary action; composition of specialists by qualification; and a reserve list of personnel recommended for managerial positions.

Figure 2- Screenshot of the Report Generator

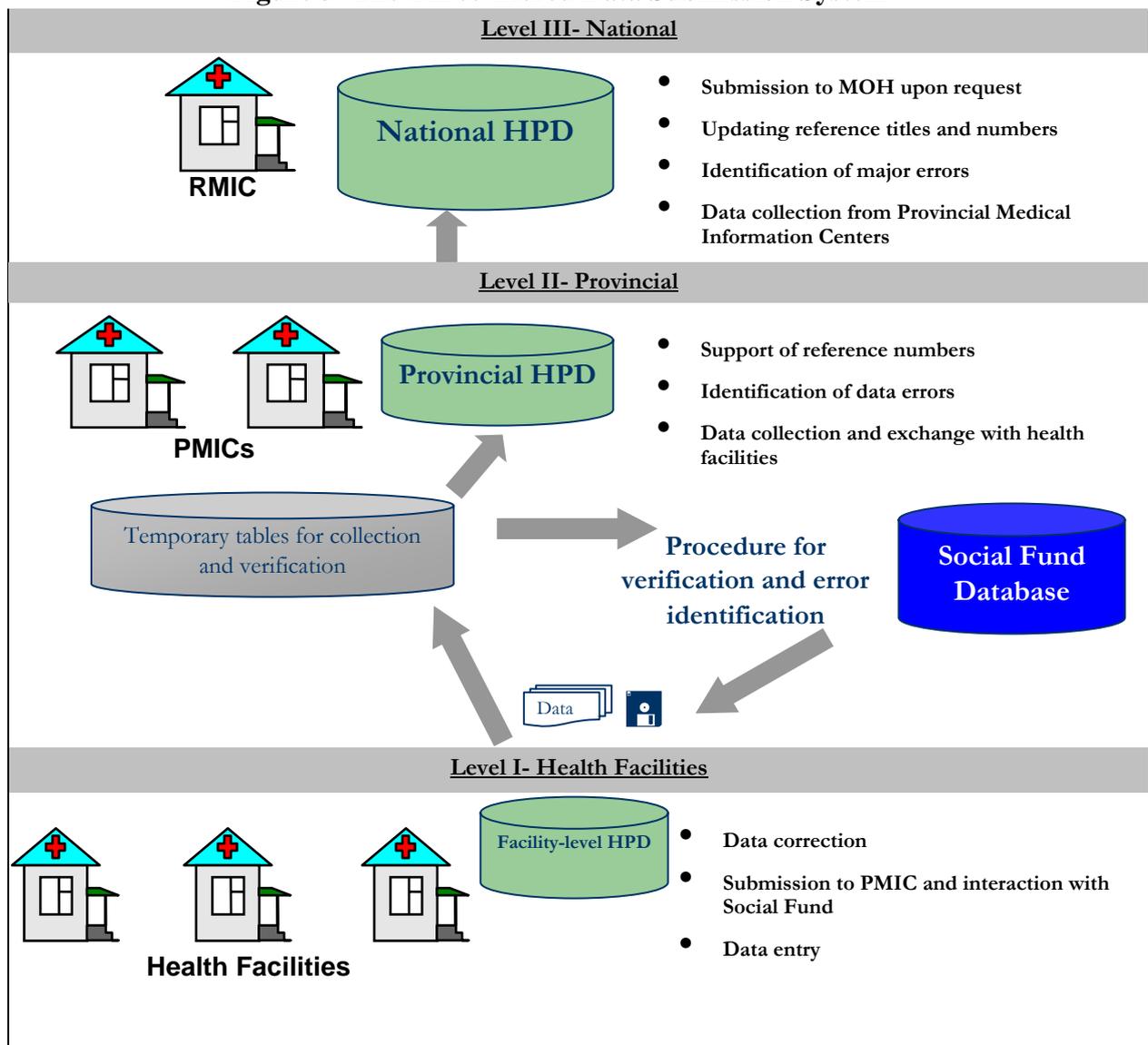
In addition to the predefined reports listed above, the report generator also includes a generic report builder and search function which can be used to create queries and ad hoc reports based on a wide-range of user-defined criteria thus assisting in data mining and analysis processes.

## VIII. Information Dissemination and Reporting

The third component of the HPD, the import and export module, allows facility-level HHR staff, PMICs and RMIC, to efficiently and continually exchange up-to-date personnel data. The method for data submission is three-tiered and currently done via e-mail, floppy drive or USB flash drive (the latter two methods are commonly used due to poor internet infrastructure in rural areas).

Facility-level HHR staff (Level I) export and submit data quarterly to one of the eight PMICs (Level II) on the 5<sup>th</sup> day of the reporting month. All data are then aggregated at the PMICs, and errors are identified and corrected by both the Social Fund and health facilities. PMICs then submit the cleaned data to RMIC on the 20<sup>th</sup> day of the reporting month. At the republican level (Level III), RMIC collects the provincial data, finds and corrects any remaining data errors, and completes final data aggregation. RMIC also continually updates the official reference titles and numbers and provides software updates to the provincial and facility-level databases. This three-tiered submission system is illustrated below in Figure 3 and is increasingly being employed by other interconnected databases within Kyrgyzstan's HIS.

**Figure 3- The Three-Tiered Data Submission System**



## IX. Strategic Utilization of Health Human Resources Data

Data from the HPD are regularly used by RMIC for its annual medical statistical book and in other HIS system components and forms (e.g. primary health care form #12 and hospital form #14). HPD data are also submitted to the MOH Human Resources Department upon request for analysis in order to inform planning and policy. For example, in both 2006 and 2007, the report, “Medical Personnel with Specialization and/or Retraining Completed”, was compared with the “Master Personnel List”. The results were sent to the Kyrgyz State Institute for Continuous Medical Education (KSICME) in order to help the Institute plan for the following year’s intake of continuing education students. Similarly, in 2007, data on the composition of medical personnel in rural areas was analyzed and used to inform the doctor deposit scheme.

Despite these examples of strategic utilization of HDP data, HHR statistical information remains underused in policy making and could be utilized in other ways. For example, the Kyrgyz State Medical Academy and the KSICME could use up-to-date statistics on the specialties of active health personnel to identify shortages of narrow specialists and update their training programs and budgets

accordingly. Similarly, a data query based on personnel nearing retirement age would aid in forecasting staffing needs and reveal impending vacancies at health facilities nationwide. This information could feed into constructive dialogue between KSMA, KSICME and the MOH Human Resources Department. Lastly, the MOH has yet to institutionalize internal scheduled data analysis. Since April 2008, ZdravPlusII has been discussing with the MOH Human Resources Department on how to improve data analysis and strategic planning processes. Scheduled quarterly data submissions from RMIC to the MOH for in-depth data analysis are recommended. The chief hindrances to implementing this change are time restraints and personnel shortages within the MOH. The MOH and ZdravPlus will continue to explore ways of institutionalizing this change efficiently.

**Text Box 3: Recommendations to Improve Strategic Utilization of HHR Data**

- Institutionalize scheduled data analysis at the MOH
- Review and revise training needs using relevant disaggregated data on personnel
- Continue to use data on rural personnel to inform the Doctor Deposit Scheme

## **X. Conclusion**

The development, implementation, and institutionalization of the National Health Personnel Database of Kyrgyzstan have been completed successfully. Health facilities are independently using the system with limited support from Provincial Medical Information Centers and the Republican Medical Information Center. The functionality of the Database has proven effective in tracking a wide range of relevant data on personnel nationwide. Data collection, aggregation and reporting on health human resource data are moving forward, and data are aiding in strategic planning and policy making in the health sector. However, these data are currently underused and the original goal of the database – to help strategically plan HHR ensuring that the right types and numbers of health care providers are meeting the needs of the population of Kyrgyzstan – needs to be reiterated by implementing relevant policies such as requiring regular scheduled data analysis by the Human Resources Department at the Ministry of Health. This should lead to further improvements in health human resources management in Kyrgyzstan, and subsequently lead to better quality of care and improved health of the population.

## XI. Annex- Official Reference Titles and Numbers

During the development of the National Health Personnel Database, the MOH and RMIC developed official lists of standardized reference titles and numbers which are used by the Database and throughout the HIS to eliminate duplication in the system and user errors. Below are two of these official lists and related unique numbers: “Types of Personnel” and “Physicians with a Higher Medical Education”.

Types of personnel	Unique number
<b>Physicians and pharmaceutical staff</b>	
Physicians with higher medical education (see subtable below for the list of titles and the related unique numbers for this category)	11
Specialists with higher pharmaceutical education	12
Physicians with higher non-medical education	13
<b>Paramedical staff</b>	
Staff with higher nursing education	21
Staff with paramedical education	22
Staff with para-pharmaceutical education	23
<b>Other personnel</b>	
Administrative and management staff	31
Teaching staff	32
Scientific-research staff	33
Engineering and technical staff	34
Administrative and finance staff	35

Unique number for physicians with higher medical education	Name of position	Unique number for position
11	Obstetrician/Gynecologist	001
11	Allergologist/Immunologist	002
11	Angio-surgeon	003
11	Andrologist	004
11	Anesthesiologist/Resuscitation specialist	005
11	Children Anesthesiologist/Resuscitation specialist	006
11	Bacteriologist	007
11	Valeologist	008
11	Virologist	009
11	Gastroenterologist	010
11	Hematologist	011

11	Geneticist	012
11	Geriatrician	013
11	Hygienist/Toxicologist	014
11	Histologist	015
11	Homeopath	016
11	Disinfectologist	017
11	Dermato-venerologist	018
11	Children Gynecologist	019
11	Children Surgeon	020
11	Dietician	021
11	Immunologist	022
11	Infection Specialist	023
11	Cardiologist	024
11	Cardio-surgeon	025
11	Clinical pharmacologist	026
11	Clinical Lab-Diagnostic Specialist	027
11	Combustologist	028
11	Cosmetologist	029
11	Lab Assistant	030
11	X-Ray Specialist	031
11	Radiologist	032
11	Manual Therapist	033
11	Medical and Social Expertise Commission Physician	034
11	Methodologist	035
11	Expert in Narcology	036
11	Neurologist	037
11	Neuro-Surgeon	038
11	Neonatologist	039
11	Nephrosis Specialist	040
11	Oncologist	041
11	Oncologist/Surgeon	042
11	Orthodontist	043
11	Otolaryngologist	044
11	Ophthalmologist	045
11	Parasitologist	046
11	Pathologoanatomist	047
11	Pediatrician	048
11	Pediatrician/Gastroenterologist	049
11	Pediatrician/Infection Specialist	050
11	Pediatrician/Neurologist	051
11	Pediatrician/Nephrosis Specialist	052
11	Pediatrician/Oncologist	053
11	Pediatrician/Pulmonologist	054
11	Pediatrician/Resuscitation Specialist	055
11	Pediatrician/Endocrinologist	056
11	Plastic Surgeon	057
11	Hospital Hygiene Specialist	058
11	Hospital Epidemiologist	059
11	Military Hygiene Specialist	060
11	Military Epidemiologist Specialist	061
11	Children and Teenagers Hygiene Specialist	062
11	Food Hygiene Specialist	063
11	Communal Hygiene Specialist	064

11	Therapeutic Physical Training Specialist	065
11	Labor Hygiene Physician	066
11	Medical Ecologist	067
11	General Hygiene Specialist	068
11	Radiation Hygiene Physician	069
11	Sanitary-Hygiene Lab Research Physician	070
11	Sport Hygiene Physician	071
11	Registration Unit Physician	072
11	Proctologist	073
11	Prof-Pathologist	074
11	Psychiatrist	075
11	Psychotherapist	076
11	Pulmonologist	077
11	Rabiologist	078
11	Radiologist	079
11	Resuscitation Specialist	080
11	Rheumatologist	081
11	Reflexologist/Therapist	082
11	Sexologist	083
11	Emergency Care Physician	084
11	Computer Diagnostics Technologies Specialist	085
11	AIDS Expert	086
11	Assistant Physician	087
11	Statistician	088
11	Stomatologist	089
11	Children Stomatologist/	090
11	Children Stomatologist/Orthopedist	091
11	Stomatologist/Parodontologist	092
11	Stomatologist/Therapist	093
11	Stomatologist/Surgeon	094
11	Judicial/Medical Expert, Biologist	095
11	Judicial/Medical Expert, Hystologist	096
11	Judicial/Medical Expert, Physicotechnical Specialist	097
11	Judicial Psychiatric Expert	098
11	Ear Physician	099
11	Therapist	100
11	Toxicologist	101
11	Throic Surgeon	102
11	Traumatologist/Orthopedist	103
11	Children Traumatologist/Orthopedist	104
11	Transplantation Specialist	105
11	Transfusiologist	106
11	Ultrasound Diagnostic Specialist	107
11	Urologist	108
11	Children Urologist	109
11	Physiotherapist	110
11	Tuberculosis Specialist	111
11	Tuberculosis Specialist/Pediatrician	112
11	Functional Diagnostics Specialist	113
11	Surgeon	114
11	Surgeon/Tuberculosis Specialist	115
11	Cytogenetician	116

11	Maxillofacial Surgeon	117
11	Expert	118
11	Endocrinologist	119
11	Endoscopist	120
11	Entomologist	121
11	Epidemiologist on Infectious Diseases	122
11	Epidemiologist/Immunologist	123
11	Epidemiologist/AIDS Expert	124
11	Family physician (general practitioner)	125