

“THE PRESENT AND THE FUTURE

OF HEALTH INFORMATION SYSTEM (HIS)
IN KOSOVO

BASIC HEALTH INFORMATION
SYSTEM IN 2020

“CAN WE EXPECT FULL
IMPLEMENTATION OF HIS IN 2020?”

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Transforming Healthcare System

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BASIC HEALTH INFORMATION SYSTEM IN 2020

The Ministry of Health presented the Strategy for Health Information System 2010-2020, a few years ago, which re-appeared as a strategic objective within the Health Sector Strategy 2017-2022, and yet we encounter a system without a functional electronic system in place. The current information system relies predominantly on paper for record-keeping and , as such, is unable to provide a feasible platform for the provider to access the medical history of the patient, or to facilitate utilization of the information to advance understanding of the general health of the population, burden of disease, and more. Incomplete information hampers the process of evidence-based policy making by the competent authorities. Until now, few changes were made, yet the main question remains: Can we expect the full implementation of Basic Health Information System (BHIS) within 2020?

THE CURRENT BHIS APPROACH

The health information system in Kosovo has been trying for a few years to evolve from a paper-based systems towards an electronic information systems for the management of health processes and health data. So far, we observed a combination of paper based and limited use of the Health Information System within healthcare facilities.

Good governance in health care requires reliable and timely information to plan, manage, and measure progress in attaining health objectives. The Ministry of Health over the last-years has been focusing on two parallel processes; creating an enabling environment by improving and investing in IT infrastructure, and developing/implementing an integrated

information system for health-care providers. The Health Information System (HIS) Department, in cooperation with the external partner, has progressed with the implementation of a comprehensive nation-wide information system, so called Basic Health Information System. The system pools information from different sources, sufficient for data analysis at the micro, meso, and macro level. Concerning infrastructure, MoH is utilizing the computers from the old HIS software - where it was implemented previously - and investing in the rest of the area to provide the necessary equipment.

In retrospect, following the discontinuity of Health Information System (HIS), the idea/need for a “basic” HIS was noted within the Restructuring Paper of Kosovo Health Project of the World Bank in 2018, mainly as a web application to capture base information for registered patients, to enable uninterrupted implementation of capitation based performance payment (CBPP). CBPP scheme has been a mechanism

designated for primary level of health care, which began implementation in 2017 by MoH in cooperation with the World Bank, under the aim of improving access to quality PHC services. Observing its capacities, flexibility, and suitability to the country-context, the system was decided to adopt few modifications and roll-out as the integrated Basic Health Information System.

The range of activities for creating the integrated BHIS was divided into eleven areas:

- 1.Functional requirements
- 2.Non – functional requirements
- 3.Flow chart of BHIS patient registration application
- 4.Additional modules
- 5.Reporting system (Business intelligence)
- 6.System administration requirements
- 7.System security requirements
- 8.Development technology requirements
- 9.System maintenance, advancement and quality
- 10.Work methodology, training and system quality
- 11.Dynamic plan for contract implementation, source code.

Reading the chart of BHIS patient registration application, it can be comprehended further that the core purpose of BHIS software was the registration of patients for medical visits to relevant medical institutions. The further

adoptions were made under the aim of optimally responding to the current needs. If successfully implemented, Kosovo shall be among the few countries with a fully integrated information system in both public and private sector.

THE SCOPE OF THE BHIS

Following the design phase, the Ministry of Health created focus groups to monitor and evaluate the development and usage of the registration application within healthcare institutions. The process of capturing user's feedback is very important to understand how the system is responding. This ongoing implementation and monitoring activity made it possible to expand the modules of BHIS beyond administrative and enrollment records. Hence, it was decided that the modules of web application – BHIS – should include/collect data as specified in the HIS 001 form, with a few modifications to meet the needs of primary healthcare institutions.

Having analyzed the operating processes, workflow and requirements of medical staff, with the aim of translating the real process into the system, BHIS grew into a comprehensive platform consisting of the modules listed below.

BHIS INCLUDES THE FOLLOWING MODULES AND SUBMODULES:

Personnel and Credential Module

Reception Module

- Patient registration Submodule
- Queue Management Submodule
- Medical Report Submodule
- Invoicing Submodule

Medical History Module

Medical Visit Module

- Anamnesis Submodule

- Examination Submodule (ICD 9)
- Diagnostic Submodule (ICD 10)
- Treatment Submodule
- Referral Submodule
- Therapy Submodule
- Conclusion Submodule

Reporting Module

Personalized Dashboard Module

Auditing Module

Appointment timetable Module

Following an ambitious plan, BHIS began pilot implementation in Drenas in December 2018. During this period, physicians and nurses were trained and supported on site for a period of time, until familiarized with working with BHIS. Analyzing the results from pilot phase, resulting in satisfactory outcomes, the system was set to go LIVE and begin with implementation in other municipalities pursuing the implementation plan.

FINDINGS

The adoption of health information technologies are at the forefront of several countries' political agendas. The potentially transformative implementation of such systems is expected to enhance work-flow, improve the quality of care, safety and effectiveness, leading to an increase in transparency and accountability within the health-care system. Effective implementation of electronic health record keeping is strongly correlated with social factors such as attitudes,

expectations, benefits, concerns and the sense of need for change; technical factors as usability, reliability, flexibility; and factors deriving from wider socio-political ecosystems as political willingness, health organizations' commitment, and professional group's contribution.

General public and policy makers have been debating and placing the implementation of HIS as a priority for a number of years, to be considered as one of the top achievements within the sector. The importance of this goal goes beyond data gathering, all the way to its interconnection with other **top priorities as functionalization of Health Insurance Fund (HIF)**, that require a clear and documented overview of the activities in the health facilities, improvement of resource management and quality of care, and enhancement of overall population health status. The current population health status does not stand at a satisfactory level with reference to other European Union countries.

Currently, what we encounter at health institutions is a **complex, repetitive and fragmented** way of delivering information. The personnel at the health institutions operates with several physical reporting sheets, and still records all the details on the protocol books. Specific hard-copy sheets containing diagnoses and procedures with ICD codes per discharged patient are sent to the health information system units for data insertion within the old HIS software. Yet, the high volume of paper arriving at the unit, hampers real-time data entry. Meanwhile, personnel and patient data, known as “midnight statistics” is still reported using excel forms. As it can be comprehended, this current disorganized method is presenting a burden to the staff by repeating the same information in various forms. The need for a unified and harmonized process, with a gradual degree of independence from paper, is definitely essential.

Kosovo still remains without full and accurate information and statistics on diseases. According

to the **National Institute of Public Health (NIPH)**, full functionalization of the health information system is necessary to be able to fulfill all the obligations deriving from the Law on Health Nr. 2004/4, chapter XI . NIPH, lacking hospital digitization, relies on excel sheets from health-care facilities. The fragmented way of reporting presents challenges for proper analysis, hence even the Health Sector Strategy calls for caution when relying on the reported results.

The roll-out of the BHIS seems to have achieved a satisfactory level, with **29 Main Family Medicine Center - out of 38 MFMC in Kosovo** - and has currently progressed at tertiary level of health care, ambulatory services. From on-site visit in Drenas, the system seems to have been well integrated, overall fit to the needs/processes of the facility, and well accepted by the physicians and nurses. It leaves one under the impression that the tool - BHIS - has been embraced as a mechanism designed to help the personnel. Beyond the storing of medical history for individual patients, the system has

contributed also to patient-flow management within the facility through submodules as Patient Queue Management. The submodule helps vastly in categorizing cases based on serial number and level of priority. Yet, there is a vast share of institutions left where the system needs to be functionalized. **From the Sectoral Strategy 2017-2021, we learn that only the primary level of care consists of 429 institutions, beyond that the system comprises of seven (7) regional hospitals and University Clinical Center of Kosovo (UCCK), and other institutions.**

The extent of BHIS modules developed allows intersection with different sources of information, enabling one to evaluate health-care system from a different dimension. The most common aspects in measuring system performance are **access, costs, and quality**. Looking into the modules of the system, one can comprehend that the system has the potential of integrating data regarding the obtaining of healthcare services, the level of resource utilization, and the level to which services produced desirable

outcomes. Using administrative, enrollment, and clinical data over the three aspects, paints a broader picture of the healthcare system and population status, to be used for better policy making by competent authorities.

From the testing phase of BHIS, it could be comprehended that the level of **computer usage knowledge** is at a limited level among health professionals at primary level of health-care. In order to ensure qualitative data, technical capacities in generating the pool of information must be built. On a few occasions, the engaged consulting firm spent more time than planned in training PHC staff in software usage. One of the key factors contributing to this is age. Older generation of doctors due to their lower level of exposure to technology in their up-bringing and less frequent usage, do vary in terms of technical capacities with reference to younger generations. The need for intensive training may be a factor in prolonging the progress of BHIS implementation beyond the intended dates.

The system as yet requires clinical modifications to adapt to the needs of each clinic. The integration of health services enables the storing and the exchanging of all types of health data among professionals. For it to be finalized, it is important to understand the business processes and clinical pathways. The importance of clinical information in conducting evaluations on clinical conditions is high, due to its scope of data, containing diagnostic information, process of care, level of prescription, utilization of resources, and health status.

One key advantage of the BHIS is that the Ministry of Health remains the owner of the system, ensuring the adequate protection of data and controlling access. As specified under the Law No. 06/L-082 on Protection of Personal Data, health information falls under the category of special data, processing of which is prohibited, except when given consent or under circumstances specified under Article 8, paragraph 2. MoH shall set procedures and regulations on who will be able to see and edit

patient information, while accessing the file using the personal number. The patient's personal number will operate in BHIS as the unique patient identifier. Thus far, the lack of an identification number has left patient information disaggregated within separate health facilities.

RECOMMENDATIONS

VISION AND BENEFIT CLARIFICATION

Advanced terms as “improved efficiency” are often used but fail to specify the benefits of such systems and are difficult to conceptualize from a time perspective. When considering only the fundamental institutional changes together with the change in behaviour by the personnel, often perceived as increased work-load, institutions tend to disengage themselves and build resistance. Policy makers need to share the vision and strategic goals with clarity and full transparency to all parties involved in order to build consensus and support. Targeted communication of anticipated benefits to patients and staff is very important to win over the doubt.

DESIGN CONSISTENCY

As understood from the above, after years of investment in the implementation and the roll out of the Health Information System, the process was not continued transitioning to a new

platform, the so-called Basic Health Information System. A decision of such a scale was one of the biggest shifts within our healthcare systems. Consistency of the design is very important; since policy makers are trying to lead a change, they need to show credibility in terms of the vision and in relation to the others that the change is safe with all the necessary support.

It has been often encountered that under the rush of excitement from such transformative and up-to-date interventions, proper analysis of system options is overlooked and hurried. It is of vast importance to be aware of different options and mechanism in collecting data, depending on the magnitude of the intervention one foresees and the value it brings. Developing their own home system or adopting an existing one, each have their own pros and cons.

CO-CREATION AND USER-INVOLVEMENT

To build willingness and have users act as agents that push forth such policies, while understanding its benefits despite the change in routine, involvement of users from an early stage is crucial. The system needs to be appropriate in terms of organizational and clinical requirements. Co-creation concept recognizes that success not only relies on the expertise of competent personnel, but also on the experience and knowledge of users. Several cases from previous international experiences with national electronic health record implementation, highlight that the lack of an effective approach to user involvement contributes to failure in reaching full potential.

Having users involved from the design phase facilitates the process of successful and informed implementation, in line with used clinical practice and expectations, and mitigates the recognized risk of the systems not being used for the intended outcomes. From a political perspective, having such stakeholders involved reduces overall resistance as project ownership is shared.

CLINICAL MODIFICATIONS

As mentioned earlier, BHIS has already rolled out within 29 Main Family Medical Centers with training completed, and has begun its expansion to the tertiary level of health care. Considering that University Clinical Center of Kosovo (UCCK) has around 37 clinics and institutes, it is important to prioritize clinics based on the national importance of data generation with high levels of accuracy, and clinics that generate a great financial burden to the budget. Collecting information as such, aids in drafting suitable policies and intervention to improve the clinical situation and have an effective use of financial resources, and researchers in understanding disease characteristics/causes which shall be incorporated for prevention. Studies have shown that some of the most common indicators in assessing health status are infant mortality rate, low-birth-weight, maternal mortality rate and the most economically costly diseases are heart disease, strokes, and cancer. With reference to the above indicators, BHIS team may prioritize clinical digitalization. Another approach in

digitizing clinical care is by focusing on specific treatment, particular patients, throughout departments by aiming to integrate entities. It is also important not to forget that the cost of clinical and hospital modifications can be considerable. System adaptation to real processes, can also be a time-intensive procedure, but is nevertheless vitally important for successful implementation.

STAFF TRAINING

Training is crucial to ensure proper usage of the system and generation of quality data. The depth of the training depends on the level of change, but it must include all the concerned staff. Lessons given to the personnel shall begin from computer training in filling the form, towards understanding case definition, international classification of disease, reporting and data analyzing. Staff capacity shall be built from the

initial phase, refreshed from time-to-time courses, and updated with new ways of disease and procedure coding. Kosovo currently reports using ICD 9 and 10 codes, and the World Health Organization (WHO) recently released the ICD 11 version, which will come into effect in 2022. Changes as such are expected to affect the current versions adopted in Kosovo as well. Studies have shown that ease of using the system and learning the steps, is among the main influencing factors of successful implementation. Considering the level of technical capabilities and the age composition of the healthcare workforce in Kosovo, intensive training and on-site support must be provided. Witnessing an ever-growing range of information systems in health-care, software usage and data analysis should be incorporated in the curricula of medical and nursing schools. This will ensure well trained human capacities to support effective usage of the system in gathering qualitative information once they have entered the labour market.

PATIENT IDENTIFIER

The authentication of the patient across all files and sources provides a powerful tool for data aggregation and data processing. The use of the ID personal number as the patient identifier is an effective and economically feasible way. It decreases the likelihood of error and administrative burden to hospital personnel, facilitates interoperability with other systems as civil registry, e-prescription, HIF information system, and enables monitoring the patient also in the private sector. Yet, some countries raised security and privacy concerns regarding the usage of ID personal number to access health data due to its wide usage, leading to other preferred alternatives for unique identifiers.

The choice of ID personal number has its benefits, but the BHIS data managers must design a system that tracks the access of the file and usage of the patient identifier. It must also evaluate privacy concerns and set procedures to what extent information is revealed and to whom.

INTRODUCTION OF DRG

As mentioned earlier, the importance of the system is also its interconnection to the implementation of the Health Insurance Fund (HIF). The healthcare financial reform foresees a transition over time from lump-sum financing mechanism towards an activity-based reimbursement methodology. For this to occur, the system must be able to provide comprehensive and current information, but also be flexible enough to adopt advanced ways of inpatient hospital payment systems as Diagnosis-Related Group (DRG). DRG inclusion ensured adequate reimbursement based on patient characteristics and health circumstances, and the severity of the disease - information which shall derive from BHIS. When designing and developing an integrated health information system of a nation-wide scale, the BHIS team should consider the possibility of future adaptations as such.

Overall, the implementation of BHIS appears to be an ambitious and promising system on the

right path towards full functionalization. As the design of the system is being done in-house, adapting to the current business process and clinical pathways within health care facilities, and training of the personnel requires time. Within 2020 we can expect a satisfactory expansion of the system, but full implementation and functionalization may go beyond next year.

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