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A Data Management Model for Proactive Risk Management in Healthcare

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Abstract: The Delphi investigation made possible to create and present a model of data flows and expertise for decision - making in healthcare. The model structures and visualizes data flows including population health risks assessment and healthcare interventions value. Most elements of this model are used in practice and are regulated by international or local documents. The investigation also indicates the need for the creation and utilization of additional level of expertise including integrated analysis and modeling of the results of management decisions. Structuring of data management in accordance with this model provides an opportunity to implement proactive risk management in healthcare there to increase healthcare effectiveness significantly.

Keywords: model, proactive, healthcare, management, data, health technology assessment, guidelines, clinical.

1. INTRODUCTION

Decision making and management in healthcare always involve the redistribution of budgets and existing major healthcare models are traditionally based on the description of financial flows [4].

The emergence of innovative technologies and their costs not only affected the quantitative changes in financial flows, but also the change in information quality, quantity and distribution in healthcare decision-making. Creation in majority of countries health technology assessment agencies responsible for expertise of clinical economic characteristics of healthcare interventions indicates the need for novel supportive models for healthcare decision making based on development and rational use of appropriate methods of prophylactics, diagnostics and treatment [7]. It is evident now that achieving both the expected results in population health as well as in rational spending of funds requires appropriate conditions for use of the intervention within healthcare system such as decrease of accessibility barriers (technological; administrative; and psychological); availability and affordability. Our early research demonstrated correlations between the number of new drugs (INN) available in the market and the reduction of patient mortality in the example of cancer. This effect was more probably induced by additional opportunities and proper healthcare management rather than the increase of clinical efficacy of these drugs [5]. These results indicate the need for a novel model of healthcare management formed around population health risks and medical technologies, which meets modern requirements and would make it possible to increase the efficiency of decision-making in healthcare independently or when used in conjunction with other models.

2. OBJECTIVES

The objective of the study was to identify the structural model for proactive healthcare management corresponding to the modern challenges of population health and health

technologies and applicable to any healthcare system regardless of funding sources and health care model as well. Oncology was chosen for the case study since this area is of great importance for population health and a significant number of new technologies allowed us to clearly identify the challenges and the processes occurring in this area [5].

3. METHOD

Modified Delphi investigation was used to determine the nodal elements of the model and their hierarchical relationships [3].

The group of analysts included 7 people. All of them had experience of practical work as doctors and healthcare management as well. Two of them had also an economic high education and experience in solving economic issues in healthcare. The other two experts had experience of data generation of medicinal products starting from laboratory investigations to health-economic assessments and inclusion of these products in reimbursement lists.

The group of experts included 64 physicians specialized in oncology who had also practical experience in management of oncology units and hospitals (finance/management/staff load). They were presented in databases of clinicians participating in international industry sponsored clinical trials and thus were well aware about worldwide experience of oncology diseases treatment.

The study was conducted in several stages:

1. Analyze of the source data and creation a questionnaire for the expert group to fill in.
2. Conducting a survey of the expert group.
3. Analysis of the responses received and development of proactive risk-management model in healthcare.

The questionnaire consists of 33 questions covering different aspects of changes during last 10 years (to link with assessment of statistical data provided by national oncology register) of factors influencing accessibility, efficacy, efficiency, effectiveness and safety of medical care and interventions to oncology patients and to express the impact of each factor in points from 1 to 5. Overall, each expert had to respond 462 questions covering 14 groups of oncology diseases according to ICD-10 WHO FIC.

4. RESULTS

The proposed structural model for assessing and proactively risks managing in healthcare is presented at Fig.1. It consists of node elements or blocks most of which have already been developed and applied in practice for expertise and decision making in healthcare.

The model is based on World Health Organization (WHO) recommendations and country commitments to use the WHO Family of International Classifications (WHO FIC). The WHO FIC contains three basic classifications making possible to form a global terminology base for discrete description of the presence or absence of diseases (International Classification of Diseases (ICD), degrees of functional body or organ impairment (International Classification of functioning (ICF) and International Classification of Healthcare Interventions (ICHI). These classifications allow to achieve comparability of data between different geographical regions and countries, as well as to observe the comparability of data over time, determine trends and make a forecast of population health. FIC makes possible to monitor population healthcare and healthcare technologies as well as making forecast in both areas [5]. These classifications allow us to achieve uniform representation of diverse data and to build predictive models according to format acceptable for regulatory decision making.

Next level of model is the assessment of Disease Burden summarizing the complex of medical, social and economic consequences of a particular disease. It is the basis for decision

on the need for medical technologies to reduce the impact of the disease and for the successive data generation on the value of this medical technology in the treatment of the disease [1,6].

Next sequential levels include data generation on the value of healthcare intervention in laboratory conditions ("Preclinical Studies") and studies with patients participation ("Clinical Studies") assessing the likelihood of an outcome, systematic reviews, and clinical guidelines (in accordance with WHO recommendations) that summarize all available information on diseases and their treatment options. Clinical guidelines are systematically developed provisions designed to help a doctor make decisions about medical tactics and the use of appropriate medical technologies in certain clinical situations. In clinical recommendations, there is a link between each statement and scientific data, and scientific facts take precedence over expert opinion. These documents do not have formal legal force, but are a tool that helps doctors make optimal therapeutic choices. The use of clinical recommendations developed on the basis of international clinical studies in specific economic conditions and the health system is the task of the government and health managers, and is carried out with the help of other formalized documents that have legal force. The development of a prognosis focused on the needs of practical health care will also provide a timely evidence base for the creation of clinical recommendations that meet the requirements of WHO and serve as the basis for treatment standards and procedures for providing medical care. [2].

The obtained information is used for the "Integrated Assessment and Scenario Models" developing with the purpose of the issue resolution, as well as for predicting of medical technologies development ("Horizon Scanning") [8]. It is obvious that market authorization of the new intervention and overcoming barriers requires time which delay the availability of medicines n market and decrease the effectiveness of healthcare system. The earlier the preparation for introduction of new interventions begins the better result can be achieved on population level. Horizon scanning deliver data for clinical and economic evaluation of drugs ("Health Technology Assessment") and for the "Integrated Assessment and Scenario Models" block which summarizes and present information for administrative solutions. It turned out that this last element of the model is practically not represented in the process of forming an expert assessment and making a decision while that the requirements for the final expert report depend on the requests of the regulatory authorities and the tasks they face.

Local legislation and formal regulatory procedures in each country form the landscape influencing on regulatory solutions which must lead to appropriate proactive risk management aimed at eliminating the predicted population health issues by accelerated development of appropriate healthcare structure and regulations as well as introduction of medicines into healthcare practice. Proper healthcare management is also linked to timely provision of information about population health threats and healthcare interventions value by physicians education at high medical schools and within in the framework of continuous medical training and professional development. Providing information to specialists and relationships with medical schools will allow them to prepare specialists beforehand, taking into account the forecast of the dynamics of public health indicators and making them familiar with innovative healthcare interventions aimed at improving these indicators.

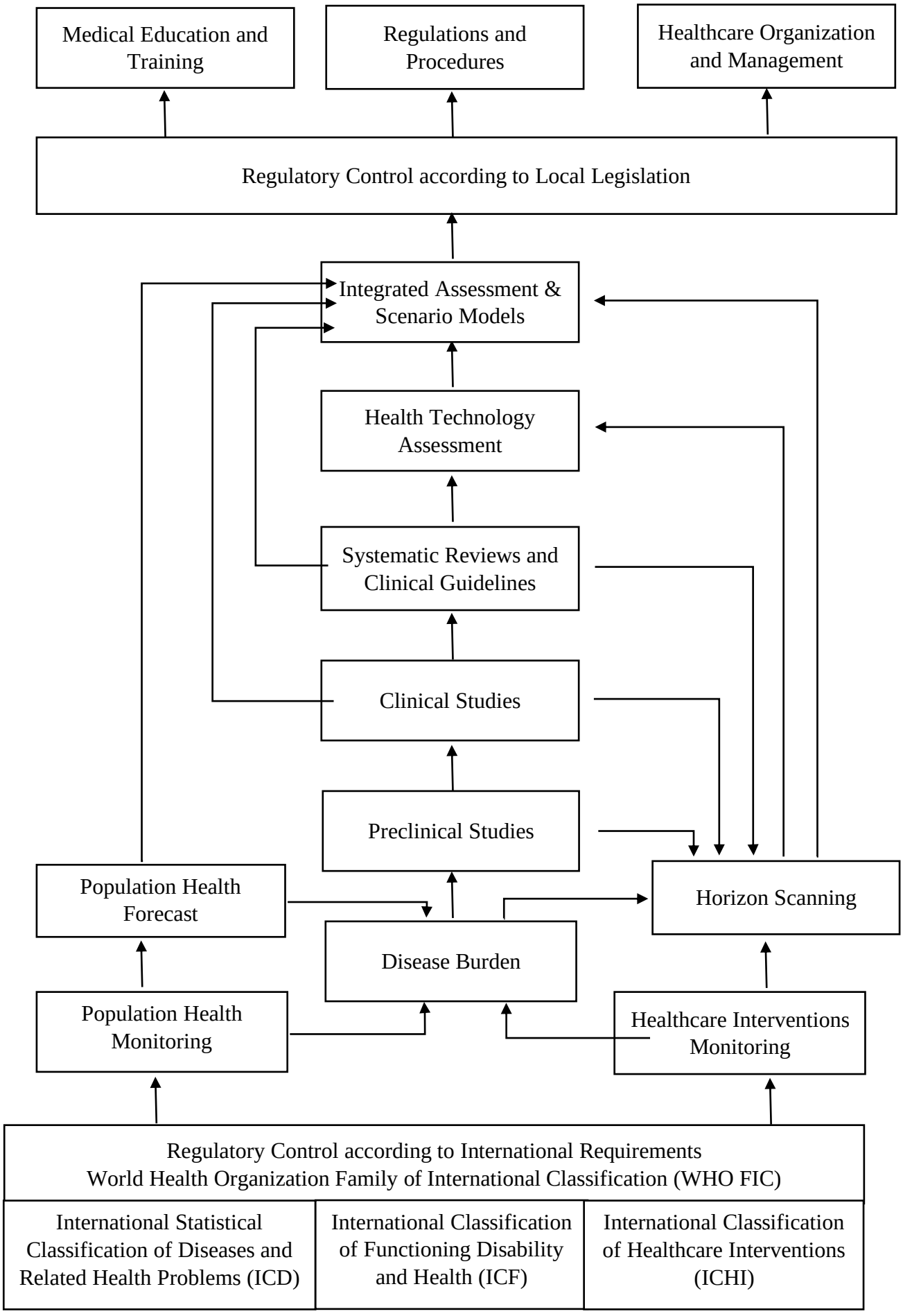

Fig.1. Node elements and data flow of the proactive risk management healthcare model.

5. DISCUSSION AND CONCLUSIONS

The model of data generation and distribution for proactive healthcare management is presented. A comprehensive evidence-based approach linked to the population health forecast provides an opportunity to improve the quality of healthcare management as well as the effectiveness of medical care. Most elements of the presented model are already existing and are used in practice. There are international or local documents regulating data proceeding for each blocks and data submission to the regulatory authorities for making management decisions. The survey indicated that the only block "Integrated Assessment & Scenario Models" is not used in practice. Regulatory decisions are made on separate assessment of clinical efficacy and safety (market authorization), clinical guidelines (education and training, regulatory procedures) and economic effectiveness (inclusion into reimbursement lists) while a comprehensive assessment of these data and modeling of outcomes under different scenarios would be the most effective solution of expert assessment and regulatory decisions in healthcare continuity.

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