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GOES DIGITAL HEALTH



Prof. Varda Shalev
Director of the Maccabi Research and Innovation Institute

Digital health as a game changer

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According to Prof. Varda Shalev, Director of the Maccabi Research and Innovation Institute, the impact of Digital Health on health care systems is profound and multi-dimensional, underscoring the changing role of both physicians and medical administrators. Due to the vast amount of data accumulated during three decades, it also manifests the Israeli health system relative advantage.

Sometimes medical developments begin with a simple human story. This was also the case in the story of Prof. Varda Shalev, primary care physician in Maccabi Health Care Services – one of Israel's largest health providers, and the head of Maccabi's research and innovation institute. "It all started with a patient, who arrived with advance Colorectal Cancer; at a point where I could no longer help him. I was frustrated because of his condition and asked myself why couldn't we predict his illness. I then decided to go through all his routine blood tests for several years" she remembers. "Later, along with the researchers of Maccabi-tech, we researched 1,074 patients with the same cancer who did not have anemia and

found that their hemoglobin level decreased for three years, although remained at the norm. These findings led me to understand how important it is to develop a tool that will allow doctors to identify the risk of developing the disease in advance, especially in 30 percent of the population who did not perform a colonoscopy or fecal occult blood test for ten years." "Following these findings, we developed together with mathematicians from 'Medial EarlySign' an algorithm that can predict the onset of colorectal cancer based on a normal blood count. We have developed a similar algorithm for predicting prostate cancer".

A change in four dimensions

The innovative developments of Prof. Shalev, a Johns Hopkins graduate in medicine and an expert in predictive analytics in the community healthcare; is only part of her work in data-driven medical innovation. She also led Maccabi's innovative medical application project, which enables users to answer a few simple diagnostic questions, creating a vast information database on patients with similar problems, complimenting the accumulated data gathered by the HMO's.

We asked Prof. Shalev about the implications of the digital revolution on health care systems, with emphasis on primary care, an area of her expertise.

"The digital revolution has defiantly changed and is still changing the health care system in four dimensions," says Prof. Shalev. "The first is the empowerment of the patient. The patient has now much more access to medical information and is much more aware of his medical condition. As physicians, we must consider the patient's opinion and understand that it can no longer be ignored. We must respect, for example, the patient's wishes for a second opinion.

"In the second dimension, the digital developments have increased the abilities of the physician. Starting with the medical studies and continuing with the daily practice, the medical information is much more accessible, and its scope is greater than ever before, enabling the physician to improve the examination and diagnosis process.

"In the third dimension, the digital has also changed the way we supervise the medical treatment. Since all the information today is available all across the board, medical managers in the HMO's have more control over the medical process. The health care provider's medical director can monitor, at any given time, the day-to-day physician's conduct. Moreover, a comprehensive view of the medical data of hundreds of thousands of patients is of great importance in analyzing health trends, predicting outbreaks of epidemics, Disease Management, and Disease Registries.

"Family physicians find it difficult to see the overall picture since they are focused on their patients," Shalev says. "The Medical Director can do this. For example, look at all osteoporosis patients and see if they are well treated, whether they have been screened and so on, and if not to issue instructions accordingly. We are moving from a **managed system** to a **managing system**, which is a huge difference, not just a semantic one."

"Also, the enormous medical data accumulated can be used for scientific and business development, due to ever-growing storage capabilities and data analytics technologies," she emphasizes. "They can be cross-referenced with other data, thus predicting diseases before they occur.

"We at Maccabi are currently engaged in initiatives and collaborations in the field of Big Data, which are carried out at the research institute, and are based on the HMO's vast database, which includes medical data of more than two million patients that have been stored for 25 years – pure gold in terms of information", says Prof. Shalev.

From vision to reality

There is no doubt that the digital revolution has profound implications for the national health system. Prof. Shalev: "The Israeli government recently announced a national initiative to promote Digital Health, investing nearly NIS 1 billion in a variety of programs. Several teams are now working to transform it from vision to reality".

You are currently involved in building a "biological bank." Can you please tell us more about this activity?

"In Israel, hundreds of thousands of blood tests, urine and excreta have accumulated. We are working to preserve it for research purposes. The goal is to build a unique bank that will become an important resource for medical research, supporting many types of contemporary research like genomics and personalized medicine".

After saying this, Prof. Shalev wants to put in place all the slogans like "personalized medicine," "disease prediction" and "Digital Health" that we have become familiar with in recent years. "There is no Digital Health – there is only health," she concludes. "Health is what is important, and the digital is only a means to improve it and to make it accessible to the public."

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MK&M Research & Innovation Institute

Morris Kahn and Maccabi Research and Innovation Institute was established in 2016. The institute's vision is to accelerate the data gathered in Maccabi and find new and innovative uses to free text, images and pathology scans. We are able to create these remarkable breakthroughs utilizing the unique partnership with Maccabi.



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