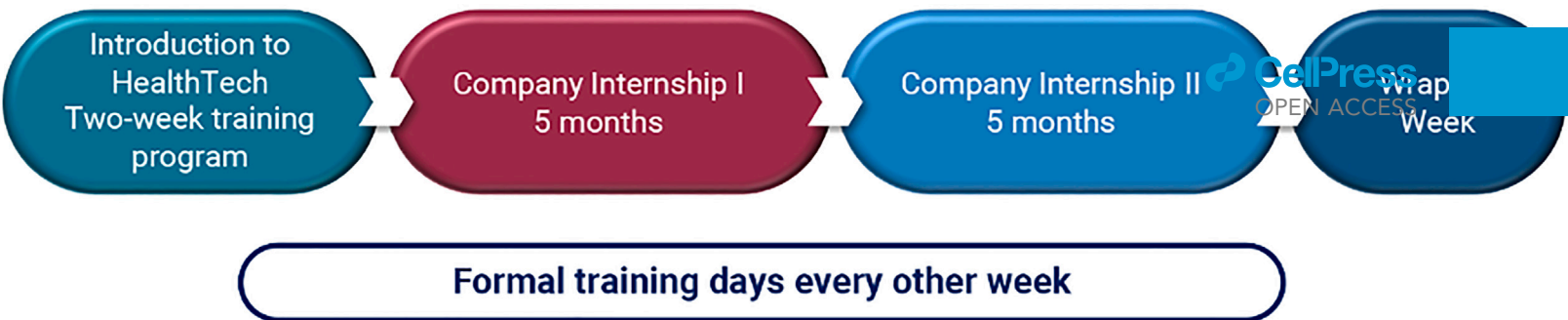


The Fellowship Journey



Backstory

Nurturing next generation physicians: A new Israeli healthtech fellowship

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The Israeli Society for HealthTech aims at advancing the integration of innovation and healthcare entrepreneurship into medical practice and across traditional health professions, to benefit patients and improve quality of care. In 2021, the Society launched the first fellowship for board certified physicians in HealthTech. This backstory discusses the motivation of launching the program and reviews the design of the fellowship, including curriculum, the expertise of the lecturers, and initial tangible results of the program.

INTRODUCTION

Israel's vibrant health ecosystem is successful and strong. Specifically, the start-up industry in Israel, across all industry domains, shows the largest number of companies per capita¹ with an estimate of 1,600+ start-up companies in the life sciences and healthcare domains, accounting for about 20%, the largest sector, of the ecosystem.² Many innovative products in these domains have emerged from basic research conducted in Israeli universities and hospitals.³ Israel is also considered among the top 5 countries leading in artificial intelligence (AI) technologies.⁴ Such technologies are becoming essential for achieving higher efficiency and better quality in health and medicine.⁵ Central to the success of this ecosystem is the possibility to establish trilateral interfaces between health organizations, academia, and industry. Unfortunately, physicians are primarily trained as clinicians and researchers but have very limited exposure to the healthtech realm, its approach, reasoning, and way of decision making. To fill this gap, and in collaboration with the 8400 The Health Network, we established in 2020 *The Israeli Society for HealthTech (ISHT)* under the auspices of the Israeli Medical Association (IMA). In the following year we launched the first fellowship for board certified physicians in HealthTech.

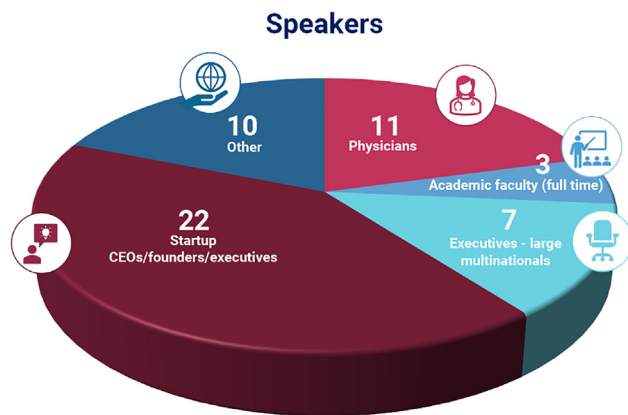
BEGINNINGS

What was the first initiative of the newly established network?

Innovation in healthtech is aimed at improving medical care by using new technologies in many aspects including medical service delivery, work processes, advanced diagnostics, treatment, follow-up modalities, disease prevention, discovery of biomarkers, and drug development. Despite the importance of these challenges, health organizations lack a critical mass of physicians with the knowledge and skills to lead the scouting, development, and integration of innovative medical technologies into current practice. Therefore, we came up with the idea to establish a fellowship program in healthtech for board certified physicians which is endorsed by the scientific council of IMA. Somewhat similar efforts include the Stanford Healthcare AI Applied Research Team (HEART), and the advanced two-year training program at Harvard called Clinical and Translational (C/T) Research Academy. HEART was founded in 2019 and aims at bringing leading edge AI/ML technologies from "code to bedside" and focuses on creating collaboration opportunities between physicians and researchers.⁶ Clinical and Translational (C/T) Research Academy has a longer

One-year program of the fellowship journey





Occupation of the speakers in the training program

history with a wide scope of topics ranging from clinical trial and study design, epidemiology, biomedical ethics, commercialization innovations, and more; the program also includes mentor-based research projects.⁷

SCOPE

What are the scope and content of the fellowship program?

The Society assembled a group of leaders who joined forces to form formal interdisciplinary fellowship program for expert physicians focusing on healthtech led by Prof. Noah Liel-Cohen. The program is axed along four main tracks: Medical Device track (led by Mr. Motti Frimer), Digital Health track (led by Prof. Michal Rosen-Zvi), Pharmaceutical track (led by Dr. Hedva Voliovitch), and Entrepreneurship and Regulatory track (led by Mr. Aviv Shoher). This fellowship is designated for board certified physicians involved mainly in clinical work that are striving to learn and be involved in the healthtech world. The team created a new curriculum that was delivered by a panel of experts from the industry, the academia, and health care organizations. Our fellows benefit from a dedicated program manager, Dr. Miri Mizrahi Reuveni, and close collaboration with healthtech companies coordinated by M. Dan Shwarzman and Dr. Adva Tzuk Onn.

The fellowship is a one-year program. It includes three phases: a series of formal introductory lectures delivered over the course of two weeks followed by two five-month part-time (two days per week) internships hosted by healthtech companies. During the internships, the trainees also meet for a whole day biweekly for further studies. At the end of the year, the trainees take part in a round-up program. Upon completion of the fellowship, participants receive a certification that attests they have fulfilled all requirements of the fellowship program in Medical Innovation & Entrepreneurship, signed by representatives of ISHT as well as representatives of the Scientific Council of the Israeli Medical Association.

LANGUAGE

How do you prepare your students/researchers to communicate in interdisciplinary teams?

In the introductory course, our fellows learn healthtech: specific terminology, strategies, priority criteria, and culture. Before they enter the period of internship within a healthtech company, we communicate with the relevant stakeholders at each company and explain the aims of the program and what is expected from the company, specifically getting a hands-on experience and exposure during the internship. The program includes support and guidance of the companies where trainees are hosted including multiple follow-up discussions to make sure the fellows are exposed to all aspects of a pre-defined agenda and syllabus. In addition, each fellow is assigned an expert physician mentor who is nominated by the Israeli Society for healthtech, typically with ample experience working with the industry and continues to practice medicine. The aim is to support both the fellows and the companies as well as to be able to offer immediate solutions to any potential conflict or challenge.

The biweekly meetings during these two internship periods include visits in different hospitals, innovation centers, accelerators, venture capital funds and healthtech companies to promote sharing of knowledge and experience between the fellows and broaden their exposure to various players in the healthtech industry. The speakers in the introductory course and across the year of training come from a diverse range of

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⁴IMed Capital GP Limited

⁵Israeli Society for HealthTech

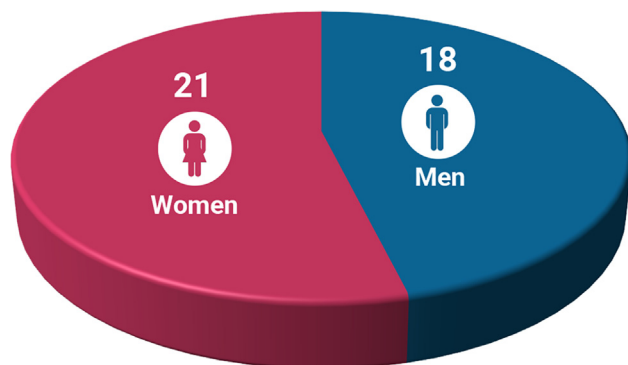
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Fellows distribution by gender

entities in the ecosystem. The educational program kicked off in May 2021 with 18 fellows from various sub-specialization, has already yielded new collaborations between medical institutes as well as between fellows and their hosting companies. A second cohort of 21 fellows joined the program in November 2022.

COOPERATION

What are the opportunities for cooperation with other healthtech education programs?

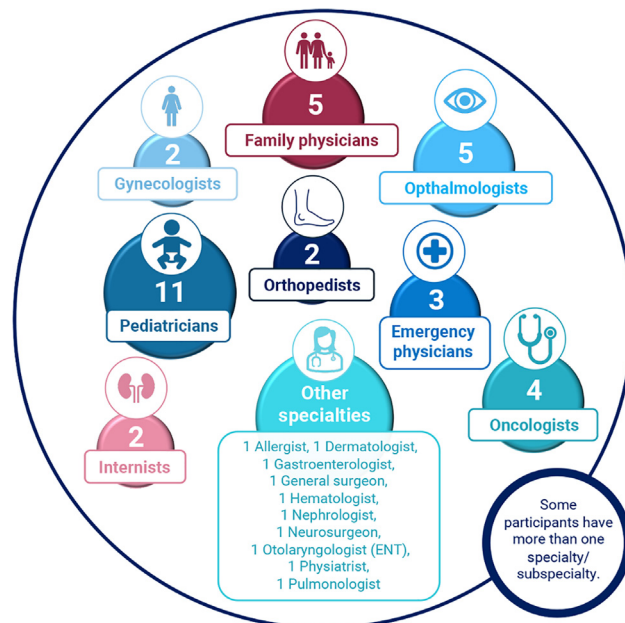
Clearly, the fellowship program equips young physicians with the tools and skills necessary to interact with medical innovation ventures of various types. The Israeli academia has offered in recent years complementary training programs that provide opportunity to deep dive into specific elements of healthtech, such as the "Introduction to Computational Medicine" annual course offered to physicians since 2022 at the Hebrew University,⁸ the Tel-Aviv university annual 'Big Data in Healthcare' course launched also in 2022 and the Technion new course on The Future of Digital Medicine - Theory to Practice launched in 2023.⁹ A few of the trainees who graduated in 2022 also joined some of these courses. Note that more than half of the 2022 fellows have already assumed new innovation roles in their organizations while keeping their roles as clinicians. Examples include the role of head of innovation in a district and the role of digital-health Project Manager at the Medical Informatics unit an HMO and advisors at a start-up in addition. Also, the whole group attended the HealthIL week¹⁰ – a leading gathering for all participants and players in this area in Israel. Some fellows presented at the Sigma Med-Tech conference 2022, in Malta.¹¹ Four of the fellowship Alumni also participated in the highly exclusive Merage Foundation Entrepreneurship Program in Los Angeles. The fellows and the Alumni were involved in the planning of the 1st summit of the ISHT, "When Medicine Meets Industry", that was held in March 2023¹² and participated in the event. Given the open nature of this event, tracking the value of the talks and networking is challenging. The testimonials from attendees of the event indicate that it was valuable and impactful for them. They described it as an "eye-opener" and mentioned that it enabled them to chart new grounds.

METHODS

What are the main methodological challenges you faced so far?

AI technologies are among the most influential technologies in the 21st century and it is obviously central to many novel medical solutions. A key concern that was recently discussed by Keane and Topol in a Lancet paper,¹³ is "how should clinicians be educated in these advances and what roles they will assume in developing, validating, and implementing these technologies". An example of the gap between the in-depth research performed in the area and the translation to the clinic is a recent meta-analysis of AI technologies role in the management of the COVID-19 crisis. It has highlighted the need for improved collaboration between clinicians and AI expert to create technology that matters.¹⁴ Another example of an area of great importance and huge opportunities is the war on cancer. This

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Fellows distribution by specialty

disease poses the world's highest clinical, social, and economical burden.¹⁵ A multidisciplinary team is needed for addressing the challenge of finding innovative cures given the heterogeneity of cancer¹⁶ and as a result the wide range of diagnostic tools and therapeutic approaches. The main challenges are to convince health organizations to invest and encourage their physicians to become involved in medical innovation. Physicians may also be reluctant to reduce their volume of clinical work both for professional and/or economic reasons. During their training, the physicians understood the important impact they can make for patients and national healthcare when working hand by hand with the developers of healthtech technologies.

PREPAREDNESS

How do you prepare the physicians for such a challenge?

As discussed above, the training program aims at addressing such challenges. It is based on class work that includes reading materials for self-learning, frontal presentations, and case studies discussions, as well as apprenticeship and mentorship. Speakers represent a wide range of stakeholders including small and mid-size startups, global technology companies, large hospitals, universities, lawyers, regulators, venture capitals, and innovation centers. They shared with the fellows their experience, achievements as well as failures and the lessons learned. The education program end with two full days of debriefing and case studies that enable debates and brainstorming regarding situations that a fellow is expected to face during their career. Each fellow is given a specific syllabus they need to go through during the two internships with healthtech companies; project presentation within the company will be arranged at the end of each of internship. The first two cohorts include 39 physicians with balanced gender distribution and a diverse set of expertise. The fellows have been engaged in various types of projects ranging from literature review, looking for new areas of implementation of an existing technology, through clinical research design up to market research, competitive landscape analysis, product-market fit, business development and adjustment of products to the healthcare. The healthtech company assigns a mentor that hosts the fellow and the ISHT assigns an experienced expert physician that mentors the trainee. Both host's and mentor's responsibility is to balance the needs of the hosting company with the exposure and learning needs of the trainee.

DIVERSE PROGRAM

What is unique about your program?

The field of training physicians in Healthtech while keeping them as clinicians is new. Most programs are multidisciplinary, in academic centers, such as the above two examples of Stanford's HEART and Harvard's

Clinical and Translational (C/T) Research Academy, and are not aimed to keep physicians as physicians. Most of the training is done by teachers with industrial experience and not from the academic world which is not the common way of training. The ISHT has a program that is supported by speakers with a diverse background. The ISHT benefits from a wide range of partners including pharmaceutical companies (e.g., Teva and MSD), technology companies (e.g., Microsoft), startups companies (e.g., Scopio) and HMO-like organizations (e.g., Maccabi).

FUTURE PROSPECTIVE

What tips would you give to anyone considering undertaking career as physician?

Physicians' most famous oath that describes their career commitment is the Hippocratic Oath. It contains the famous words, "I will do no harm or injustice to them [my patients]". With the advent of technology and its ability to offer improved care, it seems that this commitment of doing no harm and injustice might not mean only being an expert of the medical profession but also being technology savvy. Expert physicians who join the fellowship are exposed to innovative technologies and how they are integrated/can be integrated in care delivery. Some of them might be intimidated by technology while other might be attracted to it. A couple of quick tips to share with physicians addressing those who are intimidated as well as those who are attracted:

Come open-minded and you will be amazed how much and how quickly you can learn about this vibrant field.

Remember your unique strength and crucial impact is because of your hands on continuing clinical work expertise – keep it!

LOOKING FORWARD

What are the future paths of trained physicians from the fellowship program?

The fellowship program opens new horizons to the fellows. Within one year, out of the 18 alumni, 5 were nominated to lead new innovation centers and programs within prominent healthcare organizations. Two of them were selected to management position in hospitals with the aim to build programs aimed at assimilating medical innovations. Some of them are consulting to healthtech companies. A few have already written their own patents and are on the verge of launching their own start-up companies. The fellowship in healthtech is much more than a unique and strikingly successful educational program; it is setting the stage for a new professional frame of work which is likely to make significant contributions to medicine and healthcare development in Israel and elsewhere.

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DECLARATION OF INTERESTS

The authors declare no competing interests.

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