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2022

IATI Israel's Life Science Annual Industry Report

Connecting Israel's Tech Ecosystem

One Step Backwards - Advancing Towards Preventive Medicine in Childhood

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IATI is the umbrella organization of Israel's tech ecosystem with the mission of generating impact across all value chains of the Israeli economy and society

Connecting Israel's tech ecosystem

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Executive summary

IATI Israel's Life Science Annual Industry Report provides the broadest, deepest view of this thriving industry. The continuity, the annual comparison and the long-term view, all make the Report the most comprehensive take on the Israeli Life Science Industry. As the Israel's Umbrella Organization of the High-Tech & Life Science industries, IATI continuously acts to connect and promote the country's massive resources of academic and technological prowess towards creating a fertile ecosystem which will nourish growth in the coming years as well.

The Israeli life science industry kept growing in 2021 despite the COVID-19 pandemic. Continuance increase in the number of companies, stable maturity levels and innovation in new and developing sectors, all contribute to the industry's success and its significant role in the Israeli economy. 2021 was a record year in capital raising from VCs, public offerings and other investors with a challenging H1 of 2022 in these aspects.

After putting a spotlight on the industry's rising sub-sectors in our prior report, we focus this time on some new promising sub-sectors and following up on those we have identified in the past. This is in addition to the traditional sub-sectors discussed in our prior reports. The spotlight is put on those sectors not only because they are fast populated by new companies and attract more investments, but mainly as being leaders in innovation and multidisciplinary abilities, demonstrating the industry's ability to take advantage of the excellence in academic research, deep government support and the innovative ecosystem in Israel.

The healthtech industry has been experiencing dramatic changes due to the COVID-19 pandemic. From unique collaborations with players coming outside of the life sciences industry through fast paced adoption of digital health and remote health solutions, the pandemic had a huge impact on the industry. This also led to a record year when it comes to funding, as aforementioned.

The healthcare landscape is continuing to shift towards a more integrated ecosystem, converging biopharma, medtech, digital health and healthcare into a single bioconvergent industry. This emerging bio-convergent healthtech space holds great potential to make a transformative impact on health and healthcare practices. When it comes to holding a leading position in this emerging bio-convergent field, Israel has substantial strengths and capabilities. The new shifts and trends in the Israeli Health Tech space were all demonstrated for the first time in a conference driven by IATI by the industry and for the industry in continuation of the legacy of the MIXIII conference.

A broader discussion on Israel's value proposition in the bio-convergance sphere can be found in the "Bio-Convergence Revolution" chapter of this report.

The healthcare system is confronting skyrocketing costs, while the biopharma industry is coming up against aggressive pricing pressures. In an effort to meet these challenges, the healthtech industry is seeking new innovation growth engines.

Israeli life science companies can play, and in many ways already are playing, a leading role in facing the coming challenges. Fostering digital health innovation to address actual needs and not perceived ones, for example, can lead to significant improvements in integrating technological solutions, even from sources outside of traditional healthcare. We invite you to read insights from the field in the "How Can the Israeli Health-Tech Industry Reduce the Cost Burden" chapter and throughout the report.

We would like to warmly thank Omer Gavish, Partner, Pharmaceuticals & Life Sciences Leader at PwC Israel, for all the support in preparing this Report; Dr. Ami Appelbaum Chairman and Dror Bin, CEO of The Israeli Innovation Authority for supporting our Report and for partnering with us on promoting the industry throughout the year; Prof. Yossi Matias, Vice President, Engineering & Research, Google; Dr. Yair Schindel, Co-Founder & Managing Partner and the team of aMoon Fund; Oded Har-Even, Co-Managing Partner, Sullivan & Worcester Tel-Aviv; and Dr. Ruth Dagan, Partner, Head of Environment & Climate Change, Herzog Fox & Neeman.

Here's to another year of Israeli Health- Tech pride!

Karin Mayer Rubinstein

CEO & President

IATI

Yaacov Michlin

Chairman

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One Step Backwards - Advancing Towards Preventive Medicine in Childhood [51]

Since the majority of deaths in adults is linked to conditions or behaviors in childhood, any discussion around wellness and prevention of chronic illness must go back to the child. Despite its easy-to-grasp importance, the large-scale incorporation of preventive medicine into western medical establishment is relatively new. In addition to generally promoting the adoption of healthy habits, healthcare systems now execute well designed prevention strategies by offering a myriad of routine screenings (e.g blood pressure, cholesterol, colorectal and breast cancer), and by intervening even before disease appears, in cases where risk is identified (e.g post-exposure prophylaxis for HIV, statins to prevent heart attack and stroke, vaccination campaigns).

We reached a point in societal development in which we expect our healthcare systems to actively use their resources to not only treat, but also prevent our diseases, even when they afflict a thin slice of the population pie. In addition to preventing human suffering, healthcare systems also calculate the reduction in the likelihood of health emergencies and additional costs of chronic care. This important shift in the medical paradigm was brought about by increased predictive and interventional capabilities, enabling a proactive approach.

Using this rationale and expanding the time axis backwards, considering that biological and pathological processes take time to unfold, one can see that everything we do (or do not do) to promote health in children, will affect 100% of the adult population to some extent. Remember: 100% of us living adults were once children.

Through the elucidation of new molecular mechanisms and better understanding of patho-physiology, evidence-based knowledge has been accumulating as larger numbers of adult diseases emerge as having their origins in childhood. In fact, even during embryonal development, does the diet of the pregnant mother influence the epigenetic markings in our DNA with potentially life-long effect in gene expression and protein synthesis[52]. Nutritional recommendations to the mother can thus have a huge impact in the child and future adult's health.

This effect dependency is also clearly seen in Adolescents and Young Adults (AYA, 15 to 39 year group) in whom there is a rising incidence of chronic diseases, including cancer, obesity, hypertension, diabetes, metabolic syndrome, ischemic stroke, irritable bowel syndrome, and all mental health conditions. These conditions have all been linked to childhood events, or down-right started back then.

51 With the support of Mel Larrosa, CEO of Schneider Innovation Center
52 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4663595/

When speaking of children, developmental disabilities come to mind as long-term conditions, the negative effects of which may span across adulthood. This is the case indeed. In the US, about 17% of children have one or more developmental disabilities, reflecting as 1 in 6 adults presently living with such conditions.[53] Worldwide, the numbers vary significantly among countries, but the global burden has not significantly improved since 1990.

A pattern of continuity from childhood to adulthood health has consistently emerged throughout a great variety of communicable and non-communicable diseases, including those with well-documented clinical and epidemiological links (e.g tuberculosis, hepatitis B, typhoid fever, cirrhosis/liver cancer, rheumatic heart disease, diabetes, respiratory infections/bronchitis).

Another extremely important aspect is mental health. The consequences of failing to address mental health conditions in childhood are recognized in adulthood, impairing not only mental, but also physical health and limiting the ability to lead fulfilling lives. Globally, one in seven 10-19 year olds experiences a mental disorder, accounting for 13% of the global burden of disease in this age group[54].

With such high numbers, one would expect a booming field of research, and associated investment, aiming at diagnosing and treating children better not only to alleviate their ordeal, but also to avoid the life-long suffering and medical bills. Nonetheless, this is not yet the case. Even though there are almost 2 billion children in the world, around 27% of the total population, only around 10% of total investment in medical innovation goes to the pediatric field. Why are we lagging behind?

Investing in pediatric health-tech has unique features. In a strictly financial sense, research and development are more complex and, therefore, more expensive. For every new drug, device or digital tool devised for medical use, there is the need to assess any potential impact on growth and development. Informed consent to participate in trials, usually given by parents, can be sensitive when enrolling adolescents who might come to age during the clinical studies. Additionally to complying with these special ethical and regulatory protections, there is market stratification, since children are a very diverse group of patients in size (from a few hundred grams to 100kg or more), physiology, and pathology. One-size-fits-all is definitely not an option here.

53 *https://www.cdc.gov/ncbddd/developmentaldisabilities/about.html*
54 *https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health*

Despite these real, and some perceived challenges, societies are changing and impacting the moods of the market. A change in the paradigm can be observed and an inflexion point has now been reached, forcing us to decide, as a society, how to react to the impact of 'their' health (children's) on 'our' health (adults). Investors will always follow when markets are favorable and conditions appropriate.

Fortunately, markets are improving. Pediatric healthcare market forecasts predict an annual growth of over 5% in the upcoming decade, possibly with the medical devices segment continuing on the lead[55]. Venture capital funding for digital behavioral health tools for children and teenagers reached $919 million in 2021, up from $54 million in 2017 and more than double the amount raised in 2020[56].

In recent years, the realization of the need to innovate in the pediatric space has given rise to the establishment of pediatrics-only accelerators and innovation centers under the auspices of children's hospitals, e.g. in Stanford, Boston, Philadelphia, Cincinnati, London, and many others. In Israel, Schneider Children's Medical Center of Israel has established the only Innovation Center fully dedicated to the whole spectrum of pediatric innovation, which supports the development of innovative drugs, novel medical devices and new digital tools. A further growing trend is the establishment of Parent-Tech companies, such as e.g. Greenlight, Cleo, LearnPlay, OgyMogy and many others, attracting rising investments.

Governments will continue to play a critical role in this fragile environment, tasked with offering incentives and reviewing potentially excessive regulatory limitations. The standardization of pediatric-specific knowledge among all stakeholders continues to be a necessity.

As we advance through the 21st century and technological breakthroughs are taking place at breathtaking speed, our focus is shifting from treatment to prevention enabling earlier and anticipatory intervention. Unmistakably, this approach will necessitate that stakeholder in the ecosystem redirect their attention and investments to the growing and promising field of child health.

55 *https://www.einnews.com/pr_news/567488298/global-pediatric-healthcare-market-is-estimated-to-witness-a-growth-rate-of-5-1-over-the-forecast-period-2021-2029*
56 *https://morningconsult.com/2022/03/31/digital-mental-health-children-teens-data/*

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