FEATURE

Israeli HMO investments in AI pay off during the coronavirus crisis

Israel's HMOs are the backbone of the country's healthcare, and they have been developing AI systems for years. When COVID-19 hit, the technology was crucial in flattening the curve of new cases.

By Josh Mitnick

CIO |

24 MAY 2020 6:00 AST

As cases of coronavirus began spiking in Israel in March and the government still debated tourist restrictions and lockdowns, hundreds of thousands of clients of the country's largest HMO, Clalit Health Services, received an alert via text message.

It was a preemptive social distancing warning to Clalit clients considered high risk for contracting COVID-19. The HMO, which has 4.5 million members, was able to identify at-risk members by modifying an artificial intelligence algorithm already in use to handle seasonal upsurges of influenza cases.

"We were able to ascertain which high risk groups should stay home very early, before the disease became more prevalent within the population," said Ran Balicer, chief innovation officer at Clalit Health Services and the director of its research institute. "I would like to think that this effort helped maintain low mortality rates in Israel, as compared to other countries."

Clalit's identification tool is one example of how Israel's healthcare service providers have used AI to help in the country's fight against the coronavirus. In addition to proactive notification of high-risk individuals, AI-enabled healthcare technology has been deployed in a diverse set of contexts: from continuous monitoring of COVID-19 patients' medical conditions, to performing remote diagnostic tests, to streamlining data intake on corona tests**.**

Israel has been relatively successful in handling the pandemic: the coronavirus mortality rate by mid-May was 28 per 1 million, below the global average of 37 and well below the U.S. figure of 247, and most European countries. Experts attribute the success to Israel's early travel ban and aggressive social distancing policies. At the same time, hospitals and HMOs have been able to draw on a wealth of innovative technologies developed by an ecosystem of digital health startups that attracted $863 million in venture capital last year.

Declining cases allow for partial reopening

The country's declining case load allowed it to partially reopen schools and businesses after six weeks. Israel has had just under 16,700 coronavirus cases with less than 300 dead. New cases per day have dropped to less than a dozen compared to more than 700 in early April.

Back in February, as Israel's largest hospital, the Sheba Medical Center, readied coronavirus quarantine units in an underground parking deck for the arrival of Israeli tourists carrying the virus, management decided to outfit themselves with medical devices that allow patients in quarantine to perform lung and throat examinations on themselves.

The diagnostic devices, made by Israeli startup TytoCare, were already in use in the U.S. and Israel to self-administer tests on patients at home. Eyal Zimlichman, Sheba's Chief Medical Officer and Chief Innovation Officer, said the system helped to limit contact between hospitalised COVID-19 patients and medical staff, reducing transmission risk.

"We've eliminated the need for the clinician to be bedside," said Zimlichman. "Many doctors traditionally say that they don't trust the technology, and nothing will surpass in-person examination with the patients. We've found that many doctors are positively surprised."

The effectiveness of TytoCare devices is due in part to an AI algorithm that assists in the self-examination by giving feedback to patients or caregivers about how to best position the device, said TytoCare CEO Dedi Gilad. The algorithm can analyse and give real-time feedback to a patient with a thumb's up icon on a mobile phone if they successfully perform the test.

AI monitors vital signs

In addition to TytoCare, the Sheba hospital coronavirus ward employs two AI-powered devices to monitor the vital signs of patients and flag warnings of a deterioration.

It uses a respiration and heart rate monitor placed underneath a bed matreess that allows for continuous and automatic readings. The device, made by Israeli startup EarlySense, is used to identify COVID patients in danger of deterioration for potential intervention. The algorithm is based on respiratory and heart data gathered by EarlySense going back years from hospital patients on internal medicine wards, including in the US. Zimlichman said Sheba was the first hospital to use EarlySense for coronavirus patients.

"Respiratory rates are the most [important] vital sign for COVID patients. Once a patient starts deteriorating, the respiration rate goes up. Many times we miss that. These are subtle changes," he said. "Sometimes it alerts on patients that seem completely fine. But many times, an hour or two later, we see the patient deteriorate."

While Sheba uses EarlySense for patients in moderate to light condition, it uses a predictive analytics platform made by Clew Medical, another startup, to assist doctors in treating patients in intensive care. Clew's AI-engine analyses vital sign data and alerts doctors to potential complications or patients on the mend who can be removed from ventillators.

"It allows you to get a snapshot of how your patient is doing," Zimlichman said. "COVID patients are very acute, and demand a lot of resources. The nature of the problem, as we see in other countries, is that once you overwhelm your facility with COVID patients, it becomes very difficult to manage."

Machine learning taps historical data

Though much of the AI innovation relies on partnerships between healthcare providers and startups, the Clalit Healthcare Service tool to identify at-risk patients patients was developed in-house. For the last four winters, Clalit has used a machine learning tool based on two decades of electronic medical records to flag and inform members likely to have severe flu complications and prioritise who should get vaccines.

Balicer said that Clalit's members are more vulnerable to the pandemic because they are disproportionately elderly. When individuals with coronavirus began arriving in Israel, the HMO modified the tool it uses for influenza to focus on corona risk factors. The HMO sent out messages to some 200,000 members with recommendations for social distancing and hygiene. The texts were followed up with telephone calls from general practitioners.

"The fact is that we've been doing this for many years," said Balicer. "This is when it becomes life saving."

As cases of coronavirus surged in Israel in March, Diagnostic Robotics, an Israeli startup which makes an AI-powered triage and clinical predictions platform, developed a tool to predict the location of future pandemic spikes. Using virus data from hotspots in South Korea and Italy, Diagnostic Robotics developed a symptom questionnaire with HMOs and Israeli emergency medical responders.

To date, one million individuals have filled out the questionnaire, which helps point officials to the next outbreak before new cases are confirmed. Israel's Health Ministry used the tool to prepare lockdown restrictions on neighborhoods in several cities where the virus was surging.

Technology powered by artificial intelligence is also helping to cut down on bureaucracy: health providers are using robotic process automation (RPA) to streamline data entry to speed care for patients. Because recording data from thousands of daily coronavirus tests is time consuming, Israeli healthcare providers like Clalit and Maccabi Healthcare have searched for ways to improve data transfer from test laboratories to their own information systems.

To solve that challenge, both HMOs have enlisted RPA software from Israeli startup Kryon Systems. In a matter of hours, Kryon developed a tool that automates data entry by reading patient details from a spreadsheet chart from a testing laboratory, extracting the relevant information, and inputting it into their own system. The RPA tool both speeds the delivery of test results and ensures the data is entered accurately in the HMOs systems.

"Time to market is very important," said Maccabi Healthcare CIO Ofir Kadosh. At the same time, "we didn't want to compromise on the quality."

Next read this:

- *Top 9 challenges IT leaders will face in 2020*

- *Top 5 strategic priorities for CIOs in 2020*

- *7 'crackpot' technologies that might transform IT*

- *8 technologies that will disrupt business in 2020*

- *7 questions CIOs should ask before taking a new job*

- *7 ways to position IT for success in 2020*

- *The 9 new rules of IT leadership*

- *20 ways to kill your IT career (without knowing it)*

- *IT manager's survival guide: 11 ways to thrive in the years ahead*

- *CIO resumes: 6 best practices and 4 strong examples*

- *4 KPIs IT should ditch (and what to measure instead)*

💡 7 secrets of successful remote IT teams

SPONSORED STORIES ⠿

Recommended by ▷

ילדי 1989 -1959 זכאים לבדיקת כפל ביטוחים בחינם	**Most Computer Owners Don't Know This Clever Trick (Do It Today)**	איזו מנייה הכפילה את שוויה השבוע? אלגוריתם בינה מלאכותית חוזה את מדדי
פאנל המומחים לחיסכון פיננסי	Security Savers Online	I Know First תחזית אלגוריתמית לשוק ההון
	מבחן המניות הגדול של ערוץ 13: האם אלגוריתם בינה מלאכותית יצליח לנצח	
	חדשות ערוץ 13	