

NEXT ERA IN HUMAN-MACHINE PARTNERSHIPS

Health Care: Digitally Conducted Care

This brief is one of a four-part series in which we take a deeper dive into the impact that human-machine partnerships will have in four industries over the next 15 years: health care, financial services, manufacturing, and entertainment and media. For a more detailed explanation on human-machine partnerships, please download the full report, *The Next Era of Human-Machine Partnerships*, [here](#).

Emerging technologies, such as Robotics, Artificial Intelligence (AI) and Machine Learning, Virtual Reality (VR) and Augmented Reality (AR), and Cloud Computing, stand to reshape how many of us live and work over the next two decades. They will upend the way in which we coordinate our daily lives, learn new skills, make personal and professional decisions, and take care of ourselves and others.

As described in the full report, *The Next Era of Human-Machine Partnerships*, the most transformative role that today's emerging technologies will have over the next decade will be in underpinning the formation of new human-machine partnerships. These partnerships will enable us to digitally conduct our lives and learn in-the-moment, which, in turn, will reset our expectations for work and home.

While these partnerships will make their way into every facet of our lives, as with all transformations, the full impact of human-machine partnerships will vary across geographies and industries. As science fiction author, William Gibson, so aptly pointed out, "The future is here. It's just not evenly distributed yet."

So, what does the next era of human-machine teams mean for health care? With the digital health market projected to top \$200 billion by 2020, what will taking care of health and that of others look like in 2030?¹ How might our new roles as digital conductors lead to in-the-moment learning and on-demand care within the health care industry? How will the next era of human-machine partnerships reshape the way medical information is shared, diseases are treated, and new therapies are discovered?

This foresight vignette offers a first-person view of how the next era of human-machine collaborations and co-dependencies may reshape how people pursue health and well-being, however, is not intended to be a prediction of future behavior. Rather, its intent is to illustrate how people may partner with technologies, many of which exist today, in novel ways to pursue health goals. It also shows how the everyday experience of managing one's personal health may change as more of the emerging technologies become fundamental tools for improving personal and population health and well-being by 2030.



Digitally Conducted Care | 2030



Alicia Cabrera
Age: 33 in 2030

Alicia has suffered from asthma since she was a young girl. For years, she has depended on her indoor air quality monitoring system and her smart inhaler to track the environmental conditions around her. These tools, linked up first to her smart phone and later to her smart wearable, have helped refine her understanding of what triggers outbreaks, and anticipate when she might be at risk of another attack. Preventative interventions like these have helped improve her surroundings and, as a result, she has experienced fewer asthma attacks over the last decade or so.

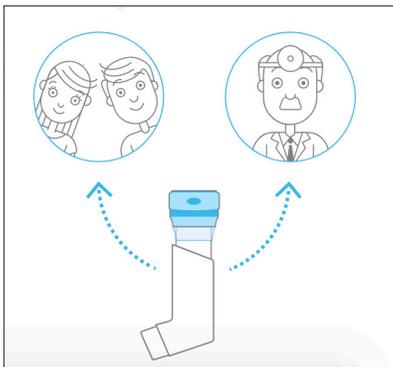
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specksensor.com/learn/particles



Speck is a Wi-Fi-enabled personal air quality monitor that measures the level of fine particulate matter in indoor settings.

propellerhealth.com



Propeller Health is a digital asthma tool designed to measure symptoms, triggers, and usage of the inhaler to reduce attacks and improve efficacy.

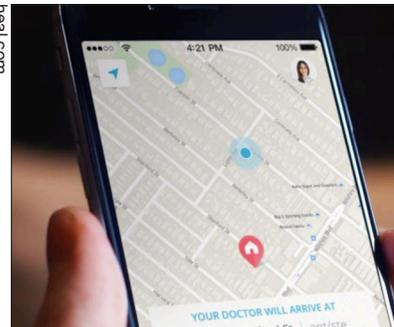
Over the last few years, however, Alicia's tracking devices have served only to confirm what everyone already knows: increased incidences of asthma all over the world are the result of changes to the global climate. Changes in temperature, humidity, and wind have increased her exposure to air pollutants and affected pollen seasons and the allergenicity of her surroundings.² These new environmental conditions have made it next to impossible for her to avoid asthma triggers.

What's worse, her attacks are more intense. Alicia now suffers debilitating migraine headaches, along with severe shortness of breath. Her current treatment helps with the respiratory issues, but it has no noticeable effect on the headaches. As much as she wishes her preventative strategies were sufficient to manage her condition, she knows that she has to expand her treatment regime in order to feel better.

A decade ago, she would simply order an in-home doctor's visit through her on-demand medical app when she was unwell. It's now 2030 and she has decided to post her symptoms to a crowdsourcing platform on which people work collaboratively to provide health advice and treatment guidance based on their personal experiences or professional training.

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heal.com



Heal is an on-demand doctor house call service that helps you request a board-certified, licensed, and background-checked doctor to come see you and your family at home.

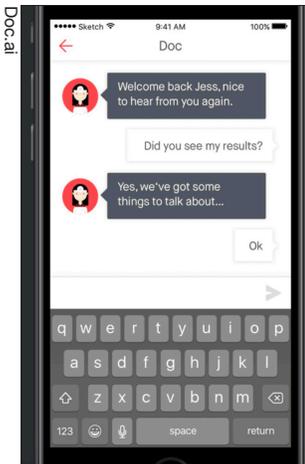
crowdmed.com/case-selection



CrowdMed connects 'medical detectives' with an untreated health condition to solve medical cases online.

A number of the medical ‘detectives’ on the platform recommended genetic testing and suggested sending the test results to an AI system for evaluation. Robodoctors have been popping up over the last few years, quickly analyzing blood work and sharing findings within hours through an intelligent conversational agent. Alicia values the speed with which robo-doctors can evaluate test results, but still prefers to work with her physician to develop her treatment plan.

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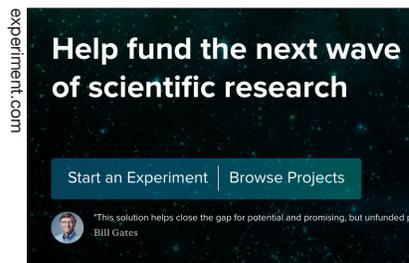


Doc.ai is building a medical dialog system and intelligent conversational agents to help users understand their blood results and genomics reports.

Alicia is hopeful that advances in genetics and gene therapies will lead to an effective treatment for her asthma-related migraines. To accelerate this, she routinely funds researchers who are conducting relevant experiments on crowdfunding platforms dedicated to supporting medical research.

Alicia knows that her modest contributions alone will not produce a remedy for her pain and fatigue. But, she believes that if a small percentage of the nearly 500 million people who suffer from the chronic disease participate in funding research or sharing health tips, the chances of her experiencing improved health by 2040 are that much greater.

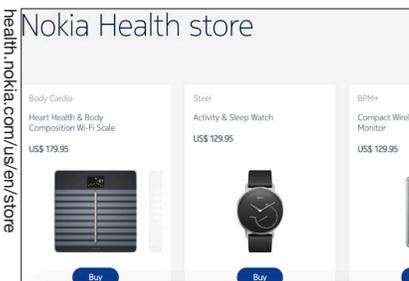
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Experiment is a platform for funding scientific discoveries.

She has also been recommended a number of newer connected products that promise to block out triggers for her asthma and headaches. However, she has the opportunity to test them in Virtual Reality first before making the purchase.

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Nokia's Healthier Together VR aims to showcase smart watches, digital scales, blood pressure monitors, and other health wearables through immersing potential users in the experience of using the tools.

Endnotes

1. Statista, Value of Global Digital Health Market from 2015 to 2020 <https://www.statista.com/statistics/387867/value-of-worldwide-digital-health-market-forecast-by-segment/>. Note: The global health digital market includes HER/EMR, Telehealth, Mobile health, and Wireless health.
2. Balbus, J., A. Crimmins, J.L. Gamble, D.R. Easterling, K.E. Kunkel, S. Saha, and M.C. Sarofim, 2016: Ch. 1: Introduction: Climate Change and Human Health. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC, 25–42. <http://dx.doi.org/10.7930/J0VX0DFW>

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201 Hamilton Avenue
Palo Alto, CA 94301
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