

IBM Watson Health and the Broad Institute Launch Initiative to Help Clinicians Predict the Risk of Cardiovascular Disease with Genomics and AI

CAMBRIDGE, Mass., Feb. 13, 2019 /PRNewswire/ -- IBM Watson Health (NYSE: [IBM](#)) and the [Broad Institute](#) of MIT and Harvard are expanding their partnership to help clinicians better predict the possibility of serious cardiovascular diseases. By working with genomics, clinical data and AI, IBM and the Broad Institute hope this three-year project will help provide doctors with tools to tap into the potential of genomics data, and better understand the intrinsic possibility an individual has for a certain disease. Equipped with this knowledge, health professionals can potentially intervene and help to reduce this risk.

This initiative will incorporate population-based and hospital-based biobank data, genomic information, and electronic health records to build upon and expand the predictive power of polygenic scoring, otherwise known as genetic risk scoring. IBM and the Broad Institute are aiming to build algorithms that can pinpoint and learn from trends in these data points, and then indicate a potential predisposition to certain health conditions. The project will also plan to make insights and tools widely available to the research community, including methods to calculate an individual's risk of developing common diseases based on millions of variants in the genome.

Ultimately, this AI technology will aim to produce models which bring together and analyze a multitude of genetic risk factors within an individual's genome, along with existing health records and biomarkers, to help clinicians more accurately predict the onset of complex and often fatal conditions in patients, such as heart attacks, sudden cardiac death, and atrial fibrillation.

This is the next evolution of genomic research between IBM Watson Health and the Broad Institute. In 2016, the two organizations [announced](#) a five year initiative to help researchers use machine learning and genomics to better understand why and how cancers become resistant to therapies.

"We're working directly with the physician-scientists at the Broad Institute to evolve how AI can help unlock undiscovered clues about human health," said John Kelly, senior vice president, IBM Watson Health. "We've built a deep expertise in applying AI to understand the complexities and meaning of immense amounts of data, such as genomics and health records. Our latest collaboration will combine these capabilities with clinical insights, and refine how technology can provide explainable and valuable insights to clinicians as they study and treat serious conditions such as cardiovascular disease."

The developed AI technologies will require innovation on three fronts: the ability to integrate several disparate types of health data for modeling; the potential to transfer and apply models on patients from different health systems; and the power to communicate insights and explain generated insights and analysis results to patients and doctors in a way that is meaningful and actionable.

Built for specific health conditions, such as cardiac arrest, these algorithms are designed to identify when a confluence of low incidence and rare genetic events come together and combine with clinical, physiological and environmental factors to form a significant risk factor for a disease. Additionally, these models will learn from various multitudes of disparate data, including the longitudinal and clinical records of individuals, electronic medical records, DNA sequencing and genetic factors. The risk analysis will aim to help health professionals identify and quantify patients' risk for cardiovascular conditions, as well as the genetic factors contributing to that risk. To better improve how this intelligence can be communicated and used in clinical settings, IBM and the Broad Institute will work closely together to incorporate direct feedback from doctors and caregivers.

"We're excited to build upon the advances we've made in polygenic risk scoring utilizing vast amount of genomic data," said Sekar Kathiresan, director of the Center for Genomic Medicine at Massachusetts General Hospital (MGH) and institute member and director of the Cardiovascular Disease Initiative at the Broad Institute. "By coupling clinical data with genomic data, there is an exceptional opportunity to make polygenic risk scoring more robust and powerful, and ultimately transformative for patient care. Such transformation could never happen without these kinds of partnerships."

The work between the Broad Institute and IBM Watson Health will initially be undertaken for three years. It will encompass a team of scientists from the Broad Institute, which was founded in 2004 with the mission to improve human health by using genomics to advance our understanding of the biology and treatment of disease, and to lay the groundwork for a new generation of therapies. The team will also include researchers and scientists from IBM, which has built a strong foundation of applying technology to some of the most pressing healthcare challenges facing society - from neurodegenerative disease and brain modeling to genomics and oncology.

About IBM Watson Health

Watson Health is a business unit of IBM that is dedicated to the development and implementation of cognitive and data-driven technologies to advance health. Watson Health technologies are tackling a wide range of the world's biggest healthcare challenges including cancer, diabetes, drug discovery and more. Learn more at www.ibm.com/Watson/health.

CONTACT: Erin Lehr Angelini, edlehr@us.ibm.com

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