astellas

Simulation of Disease Progression f Forecasting

Healthcare

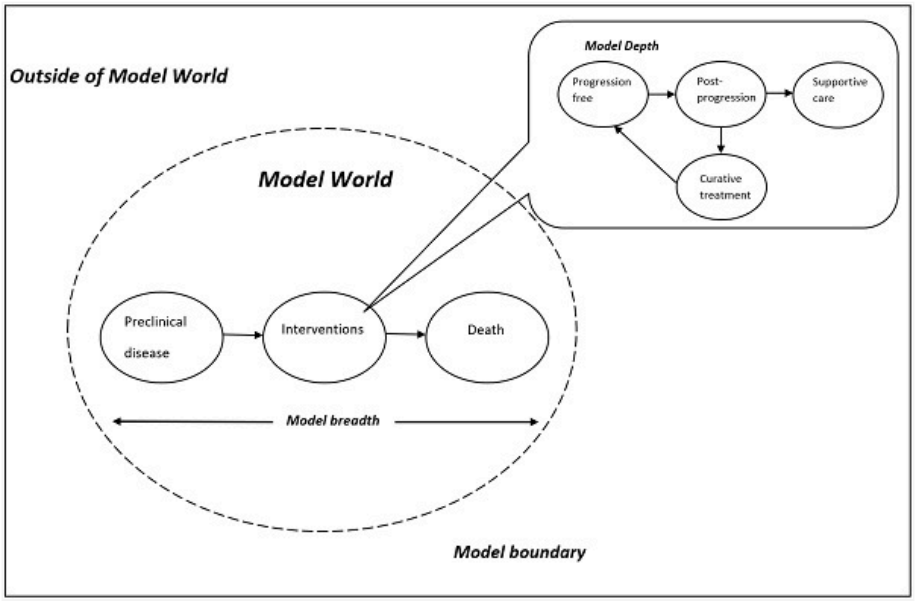
Acute myeloid leukemia (AML) is a type of cancer in which abnormal cells in bone marrow and blood interfere with normal blood cell production. This is a very serious cancer and can progress rapidly, resulting in death within weeks or months if left untreated. It is, therefore, essential to diagnose it early and ensure treatment is given as soon as possible.

Problem

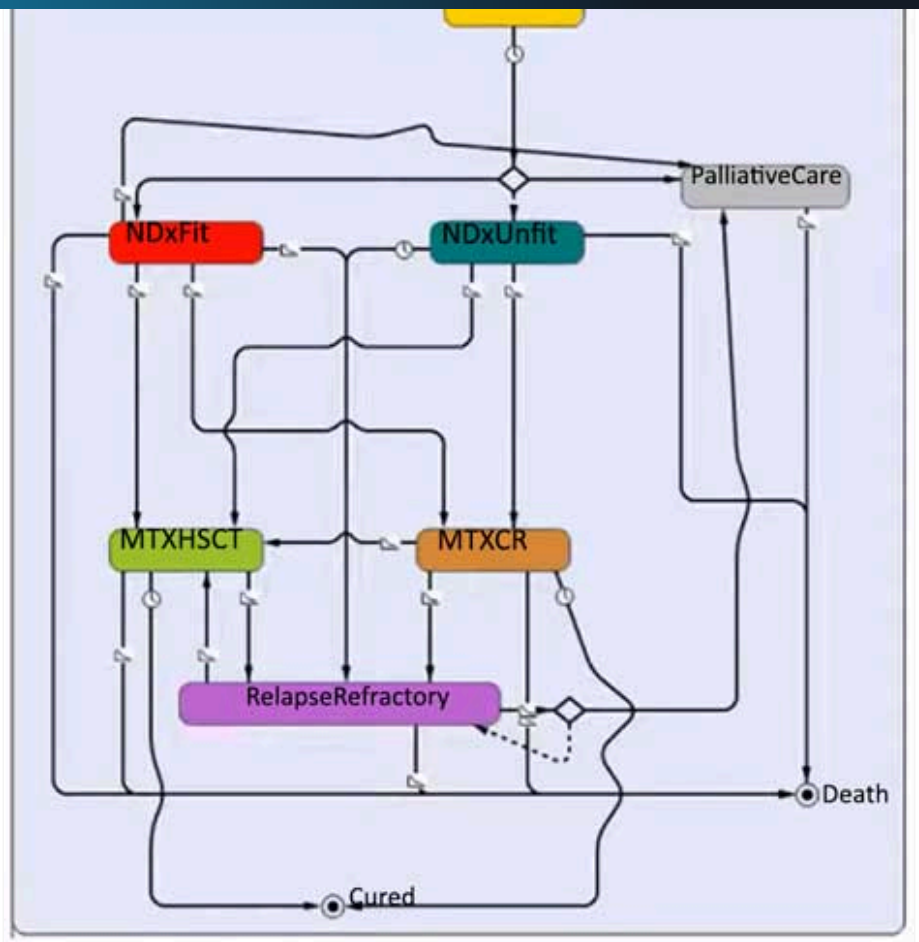
Solution

System science based models can create complete systems of disease and treatment pathways to help decision makers understand how health conditions develop and their consequences. This allows the patient to be treated, understand the progress of the patient, and finally how the patient is interacting with the system.

The benefit of systems science methodologies is that there can be integration of data and evidence from many different sources at many levels of analysis. The model below shows this in the model breadth and at a lower level – the interventions. This creates a deeper understanding of the patient and the entire market overall.



System science based epidemiology model (click to enlarge)



Agent-based model to follow the journey of patients

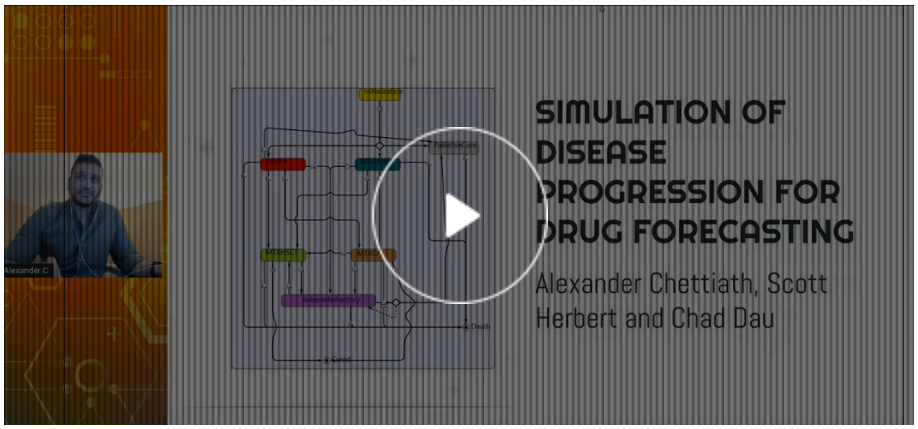
The model used publicly available data to be able to ensure accuracy and adjust for the real world. This methodology could help optimize forecasting and product planning by identifying risk.

Results

The model matched the published literature at a very high level by using different data sources. By aggregating the results into one model, the researchers could see how patients would progress from diagnosis

Astellas could then understand how changes in the market could impact patients, and then simulate how to better treat them in the future.

The case study was presented by Alexander Chettiath of Astellas, at the AnyLogic 2021 Conference.



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