PREDICTIVE *health*

Can we predict reliably who will get what disease in the future—and do something about it? Why do some people suffer from cancer, diabetes, heart attacks, depression, Parkinson's disease, fractures, osteoarthritis, and others do not? Can we predict reliably who will get what disease in the future—and also do something about it?

Using one-size-fits-all approaches and treating all individuals as if they are the same person makes little sense. Instead, we need to tailor specific interventions to high-risk people and abort the onset of disease. A better understanding of the determinants of disease susceptibility and of response to specific preventive measures may lead to more focused and efficient preventive efforts in specific populations.

Revolutionary Research Tools

The determinants of disease risk are a complex mix of genetic factors, lifestyle, everyday hazards, and socioeconomic risks. Dr. Ioannidis and his colleagues head up numerous research efforts to identify genetic and non-genetic factors that predispose to disease. The team explores how these factors interplay, which of them may be potentially easy to modify, and whether obtaining information on these factors can improve the health of people who better understand their risks. This research has been revolutionized by the availability of newer technologies of measurement. For example, instead of measuring one gene at a time, it's now possible to measure more than 10 million variants in the genome where one individual differs from another. It's also now possible to measure non-genetic risks in massive scale. Finally, it's possible to perform rigorous studies to understand the utility and impact of this rapidly accumulating information.

Making Sense of the Maze

Dr. Ioannidis and his colleagues use the latest tools in molecular biology and genetics, population sciences, and rigorous mathematical statistical methods to make sense of the highly challenging maze of predictive information.

10 million+

DIFFERENCES MAY EXIST IN THE GENOME OF TWO INDIVIDUALS

70%+

OF DISEASES HAVE STRONG GENETIC COMPONENTS THAT WE HAVE THE MEANS OF DISCOVERING

~100%

OF DISEASES SHOW LARGE DIFFERENCES IN RISK IN DIFFERENT TYPES OF PEOPLE AND SETTINGS

1 million-fold

INCREASE IN THE AMOUNT OF GENOMIC AND PREDICTIVE DATA THAT WE HAVE ASSEMBLED IN THE LAST DECADE