

## Precision Medicine

Precision Medicine as key driver of next generation personalized health care

The term “Precision Medicine” refers to the tailoring of clinical and other health care-related interventions based upon an individual’s unique make-up and circumstances. While personalization of care has long been the underpinning of best practice medicine, personalized care and Precision Medicine are not exactly synonymous. Precision Medicine is an expanded approach that uses information about an individual’s biological, environmental, and lifestyle characteristics to guide decisions related to their medical and health management.

The explicit goal of Precision Medicine is to provide a more all-encompassing approach to the prevention, diagnosis, and treatment of disease. In practice, Precision Medicine centers around the use of large volumes of data, including biological measures (e.g., genomics) for the determination of health risk calculated from patient cohorts with the same biological and clinical characteristics. The overall aim is to provide patients and their clinical team with a prevention and/or treatment plan adapted to their circumstances. In this sense, it is a more stratified and nuanced approach than personalized care, which tends to focus on more traditional clinical markers.




To answer the question posed in the title of this article, it will be helpful to explore why it is important to develop a model of personalized care based on a broader vision of health-related circumstances.







### Social Determinants of Health (SDOH):

The effect of one’s social environment (so called social determinants of health) on biological functioning has been highlighted of late in the literature (Lang et al., 2020; Palma-Gudiel et al., 2020; Lim et al., 2022) calling for a greater focus on integrating these dimensions to enhance understanding about the relationship among biological functioning, overall health status, and disease. This is where the pathways for Precision Medicine and personalized care merge, rendering health care as a truly complex, interdisciplinary, and multidimensional field.

It seems sensible to imagine that, for the purposes of overall health management, an individual is not only the sum of their biological footprint, but also by personality, health beliefs, social support, financial resources, and other unique life circumstances. These elements combined can be expected to impact the risk of developing different health conditions. The same can be said for cultivating an understanding of how well that individual will respond to interventions to prevent disease and/or how they will respond to treatment.

  
The advent of Precision Medicine is moving us closer to a more precise, predictable, and impactful way to provide health care that is customized to the individual.

Precision Medicine, because it is based on everyone's unique genetic makeup along with known SDOH markers, is beginning to overcome the limitations of traditional approaches to health care. Some of the notable benefits include:

-  Shifting the emphasis from reaction to prevention
-  Predict susceptibility to disease
-  Improve disease detection earlier when it is more treatable
-  Greater customization (and thus efficacy) of disease prevention strategies
-  Prescribe more individually tailored and effective treatments and pharmaceuticals cognizant of individual risk for side effects and related risks
-  Reduce "trial and error" inefficiencies that add to healthcare costs otherwise reduce adverse impact on patients relative to time, cost, and failure rates for treatment

Taking a broader approach to health care via advancements offered via Precision Medicine:

One key criticism of evidence-based medicine is that even tried and true medical interventions only benefit a subset of patients, but tend to be applied more broadly, exposing some patients to unwarranted cost and potential harm. Take for example, treatments that come out of clinical trials. Results are often extrapolated to individuals who may be older, sicker, have more comorbidities, and take more medications than trial participants. As a result, the potential effect of any intervention is sometimes unknown for a specific patient. Precision Medicine has been noted as a potential solution to this problem.

Of course, in practice, Precision Medicine presupposes the availability of environmental, socio-economic, and other SDOH measures which are rarely present in medical records. Nevertheless, the current focus on genomics and biological indicators in discussions of Precision Medicine should not shortchange the equal importance of SDOH, attitudes and beliefs about health, and lifestyle circumstances.

In subsequent articles on this topic, we will explore practical approaches to gathering and making available this combination of measures, as well as some interesting possibilities for incorporating into health/disease management and prevention.