

Precision Medicine: The Future Of Health



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As science and technologies advance and demand continues to grow, healthcare systems have to evolve into a more sustainable model that maintains people's wellness rather than just treating illness once it has occurred. Through a combination of proactive human interventions and decisions – supported and enabled by rich data and intelligence – that model will be more effective by being much more precisely directed at the individual.

Precision Medicine is based on four key pillars of care: Predictive, Preventive, Personalised and Participatory. A good illustration of how these four pillars work is the story of Dr Martinez, based on The Case for Personalized Medicine, Personalised Medicine Coalition, 3rd edition.

- Dr Martinez is sitting down with his laptop. On the website that he uses to manage his practice, an alert pops up warning him that several new mutations found in 10 percent of people have been discovered to be associated with the likelihood that they might convert to type 2 diabetes. All of his patients have had their entire genome sequenced and entered into their electronic medical record. He conducts a quick search of this 2,000-patient database and finds about 80 who are at risk (Predictive care).
- To half of those patients, he sends a strong reminder and advice on diet and lifestyle choices they can take to avoid the disease (Preventive care).
- For the other half, whose medical records reveal pre-diabetic symptoms, he sets up appointments to consider more proactive treatment with drugs that can prevent the onset of the disease (Personalised care).
- Patients can download an app certified by the healthcare system that will allow Dr Martinez to remotely monitor their glucose blood levels (Participatory care).

As that example shows, Precision Medicine depends on clinicians and citizens being proactive and working together to look after health and wellbeing. The success of that partnership relies on the healthcare system's ability to transfer breakthroughs in data analysis across into healthcare settings – 'from the bench to the bedside'. Massive volumes of raw, complex and heterogeneous data have to be acquired, validated, stored, processed and analysed using high performance computing systems. They then need to be interpreted and presented (through dashboards and reports) in meaningful ways to clinicians. Individual citizens can become more proactive in starting specific preventive treatments, or make lifestyle changes that prevent the onset of the disease or minimise its impact.

In this democratisation of medicine, genomic testing plays a very relevant role. DNA sequencing technologies are being adopted as part of routine practice as a powerful tool for early diagnosis and for personalised treatment. Getting access to the molecular profile of patients and correlating this data with phenotypic information (the expression of specific traits, such as stature or blood type, based on genetic and environmental influences) is an enormous cultural shift. This fast-evolving, immensely powerful new diagnostic tool is revolutionising healthcare and supporting clinicians, citizens, carers and society to work together in new ways to make predictive, preventive, personalised, participatory health and social care a reality for all.

This piece also appears in Atos' Digital Vision for Health report. You can download a copy of the full report [here](#).

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