

What Is Personalised Medicine?

The fields of medicine and healthcare have witnessed monumental advances in recent decades. Technological developments and scientific breakthroughs have meant that we are now able to understand, diagnose and treat – and even prevent – many diseases far more effectively than we could even 20 or 30 years ago.

Nonetheless, conventional medicine still broadly follows a one-size-fits-all template. Drugs and pharmaceuticals are tested during clinical trials, and conclusions are drawn about their efficacies through these. But not everyone responds to treatment in the same way; our unique genetic makeup, alongside the specific lifestyle factors that are individual to each of us, means that some people may suffer unexpected side-effects from a treatment while others enjoy a full recovery and more still do not respond at all. It's this aspect of the discipline which personalised medicine focuses on, with the UAE currently blazing a trail in this exciting new avenue of research.

The same but different

Although humans share many of the same physiological traits and features, our unique genetic and genomic composition makes us truly individual. What's more, a virtually limitless range of lifestyle factors (diet, exercise regime, occupation, environmental exposure, alcohol and tobacco consumption, etc.) further complicates matters when it comes to the diagnosis and prognosis of various ailments.

Personalised medicine, sometimes known as precision medicine, attempts to address this complexity by tailoring a treatment programme to a patient's unique circumstances. This involves analysis of their DNA, their lifestyle and a whole host of other factors to maximise the chances of a positive outcome, minimise the likelihood of unpleasant side-effects and even predict the contraction of a disease before it occurs.

Progress in the process

The idea of personalised medicine first began to develop in earnest during the 1990s. At this time, some significant breakthroughs were made in the field of DNA sequencing, allowing for the automation of the process and a more efficient throughput. The Human Genome Project (1990-2003) and the International HapMap Project (2002-2010) were both attempts to document and examine billions of human genomes from all over the world.

These studies help scientists to better understand why certain drugs had a more beneficial effect on some patients than others – and conversely why some people seemed to react badly to a specific treatment while others did not. The twin disciplines of pharmacogenetics and pharmacogenomics, alongside rapid advances in data storage, collection and

dissemination, meant that personalised medicine began to hold real promise for revolutionising healthcare as we know it.

The UAE leading the way

As mentioned above, billions of human genomes have been mapped over the last few decades, but until very recently, the Arab population comprised just 1% of that figure. This discrepancy is something that the UAE (and surrounding countries) have set about addressing, with the Emirati Genome Programme having documented the genetic code of over half a million people in the UAE to date.

The next step is contacting those who have engaged with the programme to inform them of the particular pharmaceuticals on the market that are best suited to their specific genetic profile. In both the scale of the project and the progress it has made thus far (over 5% of the entire country has already had their DNA successfully mapped), the UAE is serving as something of a pioneer in personalised medicine, creating a blueprint that others can copy and collaborate with to access the same untapped potential and the same amazing results in their own country.