Spoiled for choice

Chronic diseases: a failure of decision making

Chronic disease is the world's leading cause of premature mortality, a huge burden on healthcare costs – and, in most cases, preventable. So why aren't we preventing it? Much is down to individuals' ability to make healthy decisions. New digital health solutions aim to provide the data, support – and behavioral nudge – to enable them to do just that.

There's no doubt that in 2020 the world's attention was directed towards one disease in particular. However, in the middle of the global pandemic, the World Health Organization released their estimates of the principle causes of mortality over the past two decades, before the arrival of Covid-19.   At a moment of maximum focus on infectious disease, the top ten was notable for the predominance of non-communicable, or chronic disease, which now accounts for seven of the main causes of death worldwide.

It's proof, if any were needed, that chronic disease is now endemic across much of the globe. Chronic disease, including cardiovascular disease, cancer, diabetes and chronic respiratory disease, accounted for 74% of deaths worldwide between 2000 and 2019. Latin America is no exception. It's estimated that a third of adults on the continent suffer from a chronic disease, and that two thirds of deaths are related to one or various of them.

Much of the increase in chronic disease over the last decades can be explained by changes in behavior as societies urbanize and become richer. This shift tends to lead to, for example, greater consumption of processed food, less physical activity, and greater tobacco consumption and harmful use of alcohol, all factors proven to contribute to the development and exacerbation of chronic disease. It's certainly not irrelevant that in Latin America, nearly 40% of the adult population is overweight, and nearly 20% obese.

The human cost of all this is huge, and not just in terms of reduced lifespans. Chronic disease implies physical, emotional, social and lifestyle impacts that can be a serious obstacle to leading a complete and fulfilled life.

Then there is the economic cost. A World Economic Forum report estimates that chronic disease will cost the equivalent of nearly half global GDP during the 20 years from 2011 onwards. In most developed countries, three quarters or more of healthcare spending is dedicated to chronic disease sufferers. In Mexico, one of the countries with the highest incidence of chronic disease, it's estimated that if trends in diabetes and hypertension continue unchecked, an increase of around 6% of the health budget would be required every single year to keep up with need.

A grim panorama indeed.

And yet, as much as 80% of chronic disease is preventable. Four of the most prevalent chronic diseases – cardiovascular disease, some cancers, chronic obstructive pulmonary disease and type 2 diabetes – are linked by preventable biological risk factors like high blood pressure, cholesterol and overweight; and by behavioral risk factors such as diet, physical inactivity and tobacco use. All of these are factors that, with knowledgeable support, sufficient information and constancy, can be adjusted.

So if we can reduce the chronic disease burden in theory, why doesn't this translate to practice?

Chronic disease management is essentially, repeat decision making. Those at risk of developing chronic

disease, or who need to manage the disease once they have it, are required to make millions of decisions every day that, individually and in aggregate, will impact on their future wellbeing. But, although we may like to think of ourselves as rational and informed decision makers, the chronic disease figures suggest that more often than we would like to imagine, we make the wrong decision. To give just one example, around half of chronically treated patients in the US do not adhere to their prescription medications. With such poor decision making around what appears to be a straightforward question of obeying doctor's orders, what hope for more subtle decisions around diet or lifestyle?

One reason for bad decisions is a lack of knowledgeable support. Healthcare was and still is set up for acute conditions, and is oriented towards the one-off treatment of symptomatic problems, not underlying causes. Doctors see patients for a brief time, every three months or more. A recent US study suggests that over half of patient-doctor visits last 15 minutes or less. That's 15 minutes to assess the patient's condition, measure some relevant datapoints, take a decision on treatment, create a patient path and ensure that the patient understands what they need to do and why.

From that moment on, patients are more or less alone. Even assuming that they are able to have their questions answered during the consultation, once they are outside of the doctor's office they will be constantly bombarded by new situations for which they are likely unprepared and will have to manage for themselves. And the support that sufferers need is not just education, but emotional and psychological support and motivation to keep proactively making those decisions, every day, for life.

The rise of patient support programs (PSPs) over recent years is aimed at solving this issue. PSPs are self-management programs that may include medication counselling, training, support and virtual reminders to take medication, and other education around the disease. To some extent, they work. According to a 2016 report from Deloitte, PSPs can improve adherence to treatment plans by up to 37%. The mere fact of more frequent monitoring and control by patients of their disease is linked to better outcomes: in a classic study of type 1 diabetes sufferers (the Diabetes Control and Complications Trial or DCCT, which ran from 1982 to 1993), patients adhering to intensive treatment had fewer diabetes-related health problems in the medium term and showed lower blood glucose levels than those adhering to conventional treatment.

However, PSPs have their limitations. Although they provide a level of patient support, they don't touch two other

important factors behind poor decision making.

One of these is a lack of data. Chronic disease sufferers need to make decisions in the moment, ideally based on a clear understanding of their situation at that precise time (for example, blood pressure or blood sugar level), how that situation has developed and changed over the recent past and what has led to these changes. In most cases what they actually have, depending on their access to health professionals and their personal motivation, is at best a patchy data set, and conjecture around cause and effect. Complete and clear data can help patients and those supporting them to understand their own health situation, and conclude: "When I do x, the result is y, therefore I will do less x". When data is scarce, uneven or non-existent, decision making by default is based on generalities that may or may be applicable to the patient at that point in time.

Finally, as the latest thinking around behavioral science has shown us, even with all the relevant data to hand, humans are just not the rational decision-makers we would like to think we are. We favor instant gratification over delayed benefit (we will eat that chocolate bar even though we know it will contribute to adding a few pounds). We are disproportionately affected by

social pressure – what those around us are doing or telling us. The rules of thumb we use subconsciously to make quick decisions can lead to systematic biases, such as the availability bias by which we base our estimation of how likely an event is on the examples we have to hand. We are unrealistically optimistic about situations and overconfident in our own abilities. We generalize and find cause and effect where none exists. These and other very human characteristics have a huge impact on our decision-making abilities.

That's before we consider decision fatigue. The average adult makes around 35,000 decisions per day. The average chronic disease sufferer makes more decisions, with more important consequences, than most. And since chronic disease is for life, they have to make these decisions day in, day out, for years or even decades. Research suggests that the more choices a person makes during the day the more challenging each individual decision, no matter how small it seems, becomes for the brain (famously, the reason why Steve Jobs wore the same black polo neck every day). When a patient has to make a decision in a state of fatigue, they may react impulsively rather than thinking through the long-term impacts of the decision – resorting to the more unconscious "System 1" mental process, rather than the more rational "System 2".

They may just do nothing at all. Either way, the result is generally suboptimal.

Incidentally, marketers around the world have understood humans' propensity to use System 1 thinking for years, and have used it to their advantage in selling "quick-fix" solutions like fad diets or "ten steps"-style self-help books. It goes without saying that these are particularly bad decisions for the long-term problem of chronic disease.

That's why new digital health solutions are so exciting. They recognize that any long term approach to chronic disease management needs to be built on all three of these pillars: expert support, sufficient data and behavioral motivation. These digital approaches to disease management, also known as digital therapeutics, use the huge recent advances of technology and data science to do just that.

Digital therapeutics are able to connect different stakeholders and enable swift and secure communication and data exchange between them, across a digital platform, creating what is known as a digital ecosystem. This means that patients can get around the clock access to expert coaches or educators to help with tricky decisions, as well as being in contact with their doctors and other healthcare professionals. But so far, so similar to the patient support programs already mentioned.

However, digital therapeutics also bring data. Digital ecosystems connect phones, smart watches and a myriad of constantly evolving wearable and "smart" devices – that could include for example, in the case of patients with diabetes, everything from diet trackers to Bluetooth insulin pens to smart shoe insoles that monitor for the foot ulcers that often accompany the disease. They facilitate the constant collection of real-time patient health and lifestyle data – a world away from the one-off measurement taken in the doctor's surgery.

This wouldn't be much use if it were just a massive data dump. But digital therapeutics use data engineering and advances in AI and machine learning to digest and analyze all this data in the moment and provide key performance indicators to share with patients and healthcare professionals. Suddenly, decisions can be made based on facts and not on guesswork or one-off pieces of data. As data engineering becomes ever more sophisticated, this analysis will be accompanied by AI-powered algorithms to provide guidance to patients and even to healthcare professionals themselves.

And that all-important behavioral nudge? Digital therapeutics consciously use choice architecture, taking learnings from behavioral science to guide users to the healthiest choices given their

situation. They might for example, provide nutrition advice at the moment in which a patient is about to eat, proven to have more impact that providing the same information at a different moment; they might provide instant positive reinforcement by "gamifying" activity and rewarding good decisions; they might map out clearly and simply the health impact of different choices.

With knowledgeable support, comprehensive and clearly presented data and encouraging "nudges" towards healthy behavior, the whole relationship that a patient has with their disease can change. They are now empowered to make well-informed choices, with an awareness of the consequences, and with the back-up in place to help out when things get tricky or just too tiring. With constant access to data and support to understand cause and effect, their disease management can become proactive and educated, rather than passive and based on guesswork. Motivational interactions can help them maintain behavior during the inevitable low points that are part of the disease, and of life in general.

Maybe, finally, the theory around preventing chronic disease, can become practice.