# Vision from Orange Healthcare on 5G

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*Abstract*—**This paper describes briefly some practices relying on mobile connectivity services which are developing in the healthcare sector. We then discuss on some 5G enhancements which could bring benefits for the healthcare sector.**

*Keywords—5G requirements; health; well being*

## I. INTRODUCTION

The health sector is being deeply transformed by the adoption of Information and Communication Technologies. New health practices relying on mobile connectivity are developing beyond health big data processing and services for well ageing at home. We will first review the high level stakes of two of these practices: mobile health and connected medical devices. We will conclude by a discussion on the improvements that 5G could bring in these areas.

## II. MOBILE HEALTH

Mobile health is simply the use of mobile technologies (phones, laptops, tablets, PDAs, etc.) to provide healthcare solutions, whether this is for prevention, providing medical information or monitoring chronic illnesses.

As people become more engaged with monitoring their own health, they rely increasingly on smartphones to help them in their personal health management objectives. The Havas Worldwide Tonic survey highlights the following:

- 70% of people use health and fitness applications daily

- 70% of people think using a smartphone to track health and fitness is more important than using it for social networking, shopping, listening to music and even making/receiving calls

- 73% of people also say they are healthier because they use smartphones apps to track their health and fitness

The Socio-Economic Impact of mHealth report produced by PwC in 2013 was the first to highlight the potential and significant benefits of mobile health development for Europe. Amongst the various conclusions, the report stated that mobile health could save 99 billion EUR in healthcare costs in the EU by 2017 if its adoption is encouraged.

Mobile health services also make it possible for patients suffering from chronic conditions to have access to healthcare services outside traditional health structures. Solutions for monitoring and tools for measurement are making it possible for these patients to stay in contact with their treating physicians, at home, in the office or when they're on holiday.

In addition, mobile health could save over 1 million lives in Sub-Saharan Africa over the next five years. Indeed, the average distance between a person and the nearest medical center in Africa is 5 miles and there are 20 times less health professionals per 100 000 population in Africa compared to Europe. Therefore, access to health services with traditional means is very complex.

Encouraging results have already been obtained on this front, such as:

- Delivering prevention and awareness information via text messages to pregnant and young mothers in Mali has helped reduce perinatal and maternal mortality by 30%

- In Kenya, mobile health helped to improve antiretroviral mediation compliance by 11%

## III. CONNECTED MEDICAL DEVICES

Orange Healthcare and French health and social care mutual "Mutuelle Nationale des Hospitaliers" (MNH) have organized a survey on connected healthcare, conducted by public opinion organization ODOXA. The findings of this study, which was published in partnership with Le Figaro Santé and France Inter, were announced on 19 January 2015 at the Institut d'Études Politiques in Paris, in the presence of Axelle Lemaire, the French Minister of State for the Digital Sector.

The results of the survey show that connected healthcare devices can really help to find and execute treatments that will benefit the health of the user. Key highlights from this survey include:

- 93% of doctors believe that connected devices can help prevent health risks such as obesity, diabetes and high blood pressure.

- Only a "small minority", around 5% of patients, are equipped with connected medical devices.

- 50% of doctors think that the devices pose a threat to medical confidentiality.

## IV.   WHAT COULD 5G BRING?

One of the key objectives of 5G is to ensure a consistent user experience in various situations ranging from dense areas like a stadium or a city centre, towards villages or even high speed trains or airplanes. It means that HD video and data intensive applications will be available in much wider areas than it is the case today. For the health sector, it paves the way for rich healthcare services, enhanced with video calls and high definition images, available nearly everywhere.

In addition, 5G will be a key enabler for the Internet of Things by providing the platform to connect a massive number of objects to the Internet. 5G networks will support sensors requiring very low energy consumption, with one battery charge every 15 years. This new paradigm will be very beneficial for medical connected devices such as blood pressure or insulin body worn sensors.

Furthermore, the high reliability and security of 5G infrastructures should help to alleviate the legitimate end user and health professionals concerns about privacy and hacking around health data and services.

When thinking about new 5G capabilities in the domain of lower latency, reaching the target of 1 millisecond, we could even think of applications in the area of prosthesis or augmented human.

Starting from these first thoughts, our talk at EuCNC will open a discussion on the various use cases in the healthcare sector which could be enabled or improved by 5G technology.

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