European Technology Platform NetworldEurope

Webinar on 5G for Health and Wellbeing

POST-EVENT REPORT

Event Overview

- **Location:** Virtual Attendance
- **Date:** 27/10/201
- **Duration**: 3 hours
- **Number of registrations:** 74
- **Maximum number of simultaneous attendees/visitors:** 62
- **Number of Speakers:** 11
- **Event Post-Report drafted by:** Fatma Marzouk, with contributions from NetworldEurope and CCSA organization teams

Agenda

- **Objective**

The event aimed to raise awareness and discuss how the health and wellness sector can benefit from the next set of 5G and what is needed for the future. Particularly, the webinar aimed to share the valuable experiences and practices of Europe and China in that context.

Webinar	**5G for Health and Wellbeing NetworldEurope & CCSA**	
Date	**Oct. 27th CEST 9:30 – 12:30, Beijing 15:30 – 18:30**	
Agenda	Talk Title	Speakers
09:30-09:50	Opening speech and introduction	Rui L. Aguiar / Networld Europe, Steering board chair Wen, Ku / Vice Chairman of the Board and Secretary-General of CCSA
09:50-10:30	**Successes and Realities of 5G in Health and Wellbeing Moderators: Rui L. Aguiar**	
	End-to-end healthcare and wellness by means of 5G and beyond 5G Health Situation and Future Evolution in China	Amalia Ntemou / Solution architect, Wings ICT Solutions; 5G PPP and other European Projects Xu, Shan / Director of WHO's Collaborating Center for Digital Health, CAICT
10:30-10:45	**Q&A – Moderators: Rui L. Aguiar & Shizhuo Zhao**	
10:45-10:50	**Break**	
10:50-11:20	**Innovation in practice Moderators: Shizhuo Zhao**	
	Research on Respiratory IOT Medical Engineering **The 5G Hospital initiative**	**Bai, Chunxue / Professor and Director, Shanghai Respiratory Research Institute, Zhongshan Hospital, Fudan University. Chair of Chinese Alliance against Lung Cancer** **Prof. Dr Med. Christoph Thuemmler / Clinician at Helios Klinikum Leipzig, 5G Health Association**

11:20-12:00	**Future Requirements & Visions Moderators: Jyrki Huusko**	
	European Visions for Health & Wellbeing China 5G Health Progress & Future Requirements	Maziar Nekovee / University of Sussex and NetWorldEurope Vertical WG Chair Lu, QingJun / Chair of Telemedicine center, Vice Chair of Medical Administration, China-Japan Friendship Hospital; Deputy Chair of National telemedicine and connected healthcare center
12:00-12:20	Q&A Moderators: Jyrki Huusko & Shizhuo Zhao	
12:20-12:30	Closing words	Jyrki Huusko / NetworldEurope Expert Advisor Group Vice Chair Nan, Xinsheng / Deputy Secretary-General of CCSA

Program Summary

Opening Speech and introduction

Rui Aguiar (Networld Europe/ University of Aveiro)

Prof. Rui Aguiar welcomed the speakers and the audience, described the overall program, and stated the objective of the webinar.

Wen, Ku (CCSA)

Mr. Wen Ku Secretary-General of CCSA welcomed the participants on behalf of CCSA. Then, he evoked the main three challenges faced currently by the global medical and health sector, which include aging, chronic diseases and the lack of medical resources, and highlighted the importance of 5G in addressing these challenges. Through his presentation, Mr. Wengave a brief overview of the China Communications Standards Association (CCSA) and pointed out that 5G vertical applications such as health care are an important part of CCSA's work. CCSA was also one of the organizers of China's fourth "Bloom Cup" 5G Application Competition where the top three awarded winning projects were about medical IoT. Furthermore, Mr. Wen, Ku highlighted the realization done in china in the medical sector since 2020 and evoked the main challenges. The latter, includes among others the challenge of upgrading medical terminals to 5G and the convergence and adaptation between existing networks and 5G networks.

Session Presentations

Presenter: Amalia Ntemou, (Wings ICT Solutions)

Mrs. Amalia Ntemou started by displaying a forecast about the global telehealth and telemedicine market trend, highlighting that covid-19 has increased the incentives for efficient remote health monitoring. After giving a brief overview of Europe's strategic goals in healthcare, Mrs. Ntemou described how the healthcare vertical could benefit from the ongoing set of 5G and the upcoming set of 6G and how SMEs are vital for healthcare innovation. Moreover, the speaker described some of the end-to-end healthcare solutions tailored by Wings ICT solutions, which are empowered by 5G eventually 6G. Such solutions include the development of the STARLIT platform to support in-home and on the move emergency services. Mrs. Ntemou also presented three 5GPP projects where ICT wings is a partner, and whose objectives include leveraging from 5G for the healthcare use case.

Presenter: *Xu, Shan, (CAICT/WHO)*

Ms. Xu started by speaking about the emergency hospital in Wuhan, which was well equipped with advanced technologies such as 5G. The main application empowered by 5G included among others: 5G-based live broadcast which made real-time broadcast of the hospital construction nationwide; the 5G-Based remote consultation enabling the transmission of high definition images; the 5G-based medical robots that can disinfect the ward and distribute medical supplies which could reduce the workload of medicals as well as the risk of infection; and the 5G-based AI diagnosis that takes only seconds to process dozens of high-resolution CT data from a patient. Then, Ms. Xu shared her view on six future trends/opportunities of 5G for the healthcare sector; each trend focuses on a different layer. Trends consist of: the increase of the number of users, the network infrastructure improvement, the mobilization & intelligence of terminals, the 5G-enabled end-edge-cloud computing architecture, the controllability and the wide coverage of the applications, the three development stages undergone by the industry. The speakers then explained the future steps, which includes leveraging pilot projects to set examples of best practice on 5G for health applications to drive industry, getting further support from the specification/standards bodies to support the industry norms, and finally investing more in the ecosystem and on driving testing for standardization.

Presenter: *Bai, Chunxue,* (Shanghai Respiratory Research Institute)

Professor Bai presented his valuable contribution in the context of medical IoT (MioT) over the past years. Professor Bai, detailed the advances in the clinical application of MioT, describing the state of the clinical research and application in china. The latter includes AI-assisted early detection of lung cancer, AI-assisted management of COPD and asthma, nCapp against COVID-19. Professor Bai supported these statements by quantifying the percentage of rescued due to the use of MioT in the early detection of lung cancer. Professor Bai's presentation also discussed the objectives and the mission of the research center on respiratory MioT engineering that has recently been inaugurated at his hospital. The latter includes the early detection and risk prediction model based on multi-modality as well chronic respiratory disease and health management systems.

Presenter: *Christoph Thuemmler,* (Helios Klinikum Leipzig*)*

After presenting a brief overview of the Helios Campus in Leipzig, Dr. Thuemmler explained the importance of the application of 5G to the health sector. Dr. Thuemmler talked about the 5G-eHelthsax project, which is an accomplished project that aims to build a testbed for health technology that relies on 5G and validates with relevant uses cases. The testbed consisted in establishing the full 5G networks over a hospital in Saxony. Dr. Thuemmler presented the high-level architecture of the testbed and the target use cases from this testbed. Use cases include Infusion Pumps, Smart-Pharma, Tracing and Tracking, and cardiac monitoring. While going through these target use cases, Dr. Thuemmler shared his views on some main challenging aspects that require further efforts from the ICT community. An example of these challenges includes fitting the infusion pumps with chipsets. Christoph Thuemmler concluded his presentation by raising a set of potential topics that calls for further collaboration and investigations as well as the main lessons learned from the 5G-eHelthsax experience. The potential topics for 6G covers among others enhanced download and upload as well as new network topologies to accommodate smart pharmaceuticals, precision IoT, and massive IoT.

Presenter: *Maziar Nekovee, (University of Sussex and NetworldEurope)*

Prof. Maziar Nekovee provided an overview of the European vision for Health and Wellbeing. The overview included a presentation of the main European initiatives such as the Eu4Healh program and a highlight of the main 5GPPP projects such as 5G-Heart, 5G-Tours. The presentation also covered the rationale and aims of the WG Enabling technologies at NetworldEurope that aims to extend the engagement of NetworldEurope to the vertical sector by focusing on technology enablers and disruptive business transformation aspects toward 2030,

including beyond 5G and 6G. Furthermore, Prof. Nekovee shed light to what may 5G/6G bring to health and Wellbeing, based on the NetworldEurope SRIA document. Examples of areas to be brought by 5G/6G include new user equipment design (implantable, wearable, tattooable,..) and high accuracy localization and device-free sensing using 6G signals.

Presenter: *Lu, QingJun, (Chair of Telemedicine center)*

The presentation of Mr. Lu, QingJun described the China 5G Health progress and future promotion status. After describing the main mission of the China-Japan Friendship hospital, the speaker went through the definition of the Smart Hospital concept in China and explained that it would rely on AI applications to provide smart medicine, smart assistant, and smart management. Mr. Lu speaker followed up with examples of the 5G application deployment over the national healthcare for a nation wild telemedicine cooperation network in China. Such a cooperation network connects more than 200 hospitals all over China and relies on 5G applications such as Telemedicine, Dermatoscope+AI, Digital stethoscope, etc...). Mr. Lu's presentation evoked also the set of challenges that were faced when deploying such an initiative. Stated challenges comprise among others, the inconsistent network communication performance between hospitals and the difference between uplink and downlink data rates, which calls for the need of unifying the backbone network in China under the same standards and improving the uplink data rate. Mr. Lu presented also the approach toward tackling these challenges that involve proposing the 5G network standard based on the requirement of medical quality control and patient safety. Mr. Lu showed also the final architecture and the health application practiced in the China-Japan Friendship Hospital. The latter encompasses 5G Cloud consultation room, Digital Auscultation Remote combined, Remote Combined Ultrasound Diagnosis, and the 5G telemedicine solution for Covid-19.

Closing

Jyrki Huusko (NetworldEurope) and Nan Xinsheng (CCSA) concluded the seminar with some brief words on lessons learned during the session, and with some comments on the necessity to repeat this type of information exchange in the future. It was highlighted that in order to solve emerging challenges globally, there is a need for close collaboration to share the best practices and experiences between different stakeholders. Although there are differences in local approaches, the overall challenges are global for lack of medical and also telecommunication expert personnel and aging society. In order to benefit from new technology in the medical field more experts are needed, who can combine the telecommunication and medical domain specific expertise. Xinsheng Nan pointed out that medical IoT is an inevitable trend and by connecting hospitals in all the levels; patients, doctors, instruments and enabling connectivity also for distant rural patients, we are truly able to solve the problems of aging, chronic diseases and medical resources.

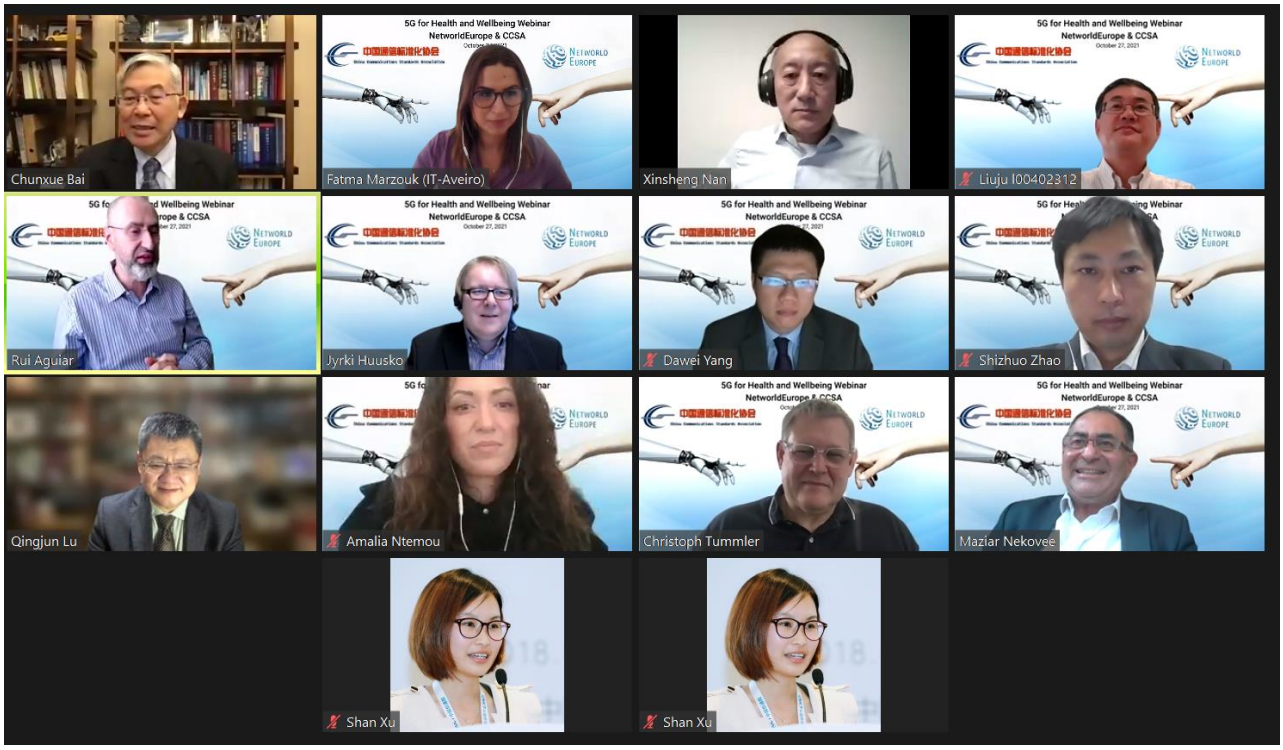
Main Lessons learned and recommendations for future steps:

The webinar highlighted that the current 5G is too complex, and far from plug and play. It also pointed out that the performance of 5G is very different from a pilot to a real network. The webinar identified the potential open challenges that need to be addressed by the near-time-future releases and upcoming 6G, which include among others: enhanced download and upload, new network topologies to accommodate smart pharmaceuticals, precision IoT, and massive IoT; upgrading medical terminals to 5G and ensuring the convergence and adoption between existing networks and 5G networks. It also led to the identification of some key future steps that consists in:

-Conducting cost-effective 5G application models under the STANDARD guideline based on the requirement of medical quality control and patient safety.

- Leveraging from pilot projects to set examples of best practices on 5G for health applications to drive industry, getting further support from the specification/standards bodies to support the industry norms, and investing more in the ecosystem and on driving testing for standardization.

-Last but not least, we should strive for establishing further collaboration between Europe and China for future standardization and continuing the dialogue as soon as possible.



Feedback after the session

Several formal and informal feedback was received after the session, both from European and Chinese participants. There was a large agreement on the feedback, with compliments on the quality of the webinar and its content.