



Case Study

Wireless Heart Health: Using 3G to Assist Underserved Patients with Cardiovascular Disease

According to the World Health Organization, chronic diseases—like cardiovascular disease (CVD)—have placed a grave economic burden on countries.¹ In fact, China will lose USD 558 billion between 2005 and 2015 in national income due to heart disease, stroke and diabetes alone.² Wireless Reach, in collaboration with Life Care Networks and the Community Health Association of China has partnered to use 3G enabled heart monitoring mobile phones for the prevention and care of cardiovascular diseases for underserved communities in China.

Challenge

- CVDs are currently the leading cause of death in China, responsible for about 3 million deaths annually.³ By 2020, this figure is projected to increase to four million deaths per year.⁴ CVDs also are the number one cause of death globally; more people die annually from CVDs than from any other cause.⁵
- The main challenge is efficiently and effectively reaching patients with CVD. Luo Zhengxiang, head of the Guangdong Cardiovascular Disease Research Institute⁶ notes, "CVD has spread to many rural areas in most parts of China, where medical care is less adequate than what can be found in the cities."⁷

Solution

- To overcome this challenge, the Wireless Heart Health project deployed a cardiovascular monitoring system for resource-scarce, community health clinics located in Shandong, Anhui, and Sichuan provinces as well as the Chongqing municipality. The system is an electrocardiograph sensor built into a mobile phone, which a patient holds for approximately 30 seconds in order for their heart data to be collected and delivered via 3G in real-time, to a cardiac specialist in the Beijing Life Care Networks Call Center.
- The Call Center is staffed by 30 physicians and provides 24-hour a day services, such as remote monitoring, diagnosis, clinician consultation and treatment. Patients can receive real-time physician feedback on their cardiac data via SMS or a phone call.
- All the health care workers in the system, both the cardiac specialists and the others from community clinics, have access to the comprehensive web-based electronic patient record, including historical heart data, via 3G wireless workstations, which eliminates any gaps in information about the patient's condition and enhances the ability to provide better care.

China Health Care



Partners

- Life Care Networks
- Community Health Association of China
- China Telecom

2010 Statistics

- Life expectancy: 74.51 years
- Population: 1,330,141,295
- GDP per capita: USD 7,400
- Internet penetration: 31.6%
- Mobile penetration: 62.31%

Sources: CIA World Factbook (<https://www.cia.gov/library/publications/the-world-factbook/>); Mobile penetration data provided by Informa UK Limited and based on market intelligence. Internet penetration data provided by www.internetworldstats.com and based on data published by Nielsen Online, the International Telecommunication Union, GfK, and local regulators.



A patient uses the 3G cardiovascular sensing device to measure his heart data, which will be sent to a specialist for feedback in real-time.



- For simple cases, the physicians in the Call Center can provide diagnosis, consultation and treatment remotely. For more complex cases, patients are screened by the system and then referred to specialized hospitals to have further testing or to receive treatment.
- By utilizing 3G wireless technology to collect heart data of underserved patients and send it to specialists, this project successfully overcomes some of the barriers to screening for and treating cardiovascular diseases.

The Technology

- 3G cardiovascular-sensing smartphones and an application that sends patient heart data over China Telecom's 3G EV-DO network for analysis at the Beijing Life Care Networks Call Center.
- Web-based electronic medical record software maintains a historical record of patient cardiovascular monitoring data and patient information.
- 3G wireless workstations located within the clinics that include a computer terminal with access to the Internet, which provides health care workers with instant access to the electronic patient records including their ECG test results.

Project Partners

- **Community Health Association of China** aids in site selection, project implementation and impact analysis.
- **Life Care Networks** provides the 3G cardiovascular-sensing smartphones and remote consultation, diagnosis and treatment services through their Call Center. Life Care Networks also conducted the technical training of participating clinicians.
- **Qualcomm's Wireless Reach™ initiative** is the main project funder and provides project management support.



Four community health clinics located in Shandong, Anhui, and Sichuan provinces as well as the Chongqing municipality participated in the project.

¹ http://www.who.int/chp/chronic_disease_report/media/Factsheet4.pdf

² Ibid.

³ China CVD Report 2010, published by China National Center for Cardiovascular Diseases under the administration of the Ministry of Health. http://news.xinhuanet.com/society/2011-08/12/c_121852777.htm

⁴ <http://www.nhlbi.nih.gov/about/globalhealth/centers/china-center-of-excellence.htm>

⁵ <http://www.who.int/mediacentre/factsheets/fs317/en/index.html>

⁶ Guangdong Cardiovascular Disease Research Institute is one of eight research institutes at the Guangdong Medical University located in Guangdong Province, which is on the South China Sea coast.

⁷ http://www.chinadaily.com.cn/life/2009-04/21/content_7698500.htm

Qualcomm's Wireless Reach™ Initiative

Qualcomm believes access to 3G and next-generation mobile technologies can improve people's lives. Qualcomm's Wireless Reach initiative is a strategic program that brings wireless technology to underserved communities globally. By working with partners, Wireless Reach invests in projects that foster entrepreneurship, aid in public safety, enhance the delivery of health care, enrich teaching and learning and improve environmental sustainability. For more information, please visit www.qualcomm.com/wirelessreach.