



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



## The internet hospital: an emerging innovation in China

A new approach to outpatient service delivery has been developed in China. Patients go to a medical consultation facility near their home and meet through the internet with a doctor who is based in a top-level hospital in a big city. The doctor asks the patient about his or her state of health via a webcam, through an instant chatting platform designed for the internet hospital. The patient answers questions and shows or sends images of his or her medical checks to the doctor through the internet. Meanwhile, data for the patient's body temperature, blood pressure, and blood glucose concentrations can be obtained by machine-operated devices on site and uploaded to the diagnostic system. The doctor then makes a diagnosis and prescribes for the patient online. A few minutes later, the prescription is printed out and can be used to buy drugs at the consulting facility or another drug store.

This outpatient service is in use in Guangdong province, China, where the first officially approved so-called internet hospital went online on Oct 25, 2014. The internet hospital consists of four clinics operated by doctors from the Second People's Hospital of Guangdong Province, an online platform operated by a medical technology company, and a network of medical consulting facilities based in clinics in rural villages, community health centres, and large pharmacy chain stores. By the end of 2014, the internet hospital was dealing with almost 200 patients and issuing about 120 prescriptions every day. By April, 2015, the number of patients per day had already surpassed 500, and about 300 (60%) of these patients needed prescriptions.<sup>1</sup> Within several months, the network of internet medical consulting facilities has expanded to more than

1000 sites, covering 21 municipalities in Guangdong province.<sup>1</sup>

Since the severe acute respiratory syndrome epidemic in 2003, the Chinese government has been rebuilding the three-tier health-care system and investing in primary health-care institutions. Its ongoing health-care reform has greatly improved primary health-care services, yet many people still complain that health-care access is difficult and medical costs are expensive. One of the main contributing factors to poor access to high-quality health care is that patients in China can choose a medical institution and a doctor freely, and they tend to go to high-level hospitals even for mild symptoms, effectively overcrowding those hospitals.<sup>2</sup> Although many disorders could be treated in primary health-care institutions with convenient access and at an affordable price, many patients are unwilling to go to these institutions owing to their lack of confidence in the health professionals' skills and the quality of health care provided.<sup>3</sup> Indeed, skilled doctors are unwilling to work at the community level and in remote rural areas for financial and professional reasons. The internet hospital seems to provide a feasible solution to meet demands for high-quality outpatient services conveniently.

The internet enables people to overcome geographical obstacles to health-care access. Patients just need to visit their community health centre, village clinic, or a pharmacy nearby to obtain a consultancy and diagnosis from skilled doctors based in big cities. Doctors from the internet hospital can spend 10 min or more to communicate with each patient, whereas a clinic consultancy at a top-level hospital normally lasts only a few minutes.<sup>4</sup> The satisfaction score is high according to the patients' online assessment after the consultancy.<sup>5</sup> Besides, it is much cheaper than outpatient costs for traditional hospital visits. The present

cost of drugs of a prescription from the internet hospital is about ¥60 on average, only a quarter of the average cost of drugs from a top-level hospital.<sup>6</sup>

The internet hospital programme is still in the exploratory stage, and many problems remain to be solved, such as the incorporation of internet medical services into health insurance programmes, surveillance and quality control, the applicability of internet diagnoses for some diseases, possible medical disputes, and long-term return on investment. Nevertheless, this programme is developing at a substantial speed in China. The expansion of internet medical services in China suggests a direction for future health care.

With the wide availability of the internet and decreasing cost of distant medical services over time, the internet hospital model has implications for many developing countries, where medical services and resources are concentrated in big cities. It also has implications for the health of migrants and cross-country health care. Besides, the system could improve health education and raise health awareness among the wider public, since patients can easily gain access to professional health consultancy.

We declare no competing interests.

Copyright © Tu et al. Open Access article published under the terms of CC BY-NC-ND.

Jiong Tu, Chunxiao Wang,  
\*Shaolong Wu  
wushlong@mail.sysu.edu.cn

School of Sociology and Anthropology, and Center for Medical Humanities (JT), School of Government (CW), and School of Public Health (SW), Sun Yat-sen University, Guangzhou 510275, China

- 1 The Second People's Hospital of Guangdong Province. Internet hospital of Guangdong province: making quality resources from top level hospitals available widely. April 8, 2015 (in Chinese). [http://www.gdzh.com/news/yydt/a\\_101582.html](http://www.gdzh.com/news/yydt/a_101582.html) (accessed April 18, 2015).
- 2 Wagstaff A, Lindelow M. Can insurance increase financial risk? The curious case of health insurance in China. *J Health Econ* 2008; **27**: 990-1005.
- 3 Yip W, Hsiao W. Harnessing the privatisation of China's fragmented health-care delivery. *Lancet* 2014; **384**: 805-18.

- 4 Internet health care experience report. *Southern Metropolis Daily* (Guangzhou). April 17, 2015 (in Chinese). [http://epaper.oeeee.com/epaper/G/html/2015-04/17/content\\_3409558.htm?div=-1](http://epaper.oeeee.com/epaper/G/html/2015-04/17/content_3409558.htm?div=-1) (accessed April 20, 2015).
- 5 Healthcare online: average medication cost is 62 yuan per person. *Guangzhou Daily* (Guangzhou). April 9, 2015 (in Chinese). [http://gzdaily.dayoo.com/html/2015-04/09/content\\_2900616.htm](http://gzdaily.dayoo.com/html/2015-04/09/content_2900616.htm) (accessed April 19, 2015).
- 6 China health statistic yearbook 2013. In Chinese. <http://www.nhfpc.gov.cn/htmlfiles/zwgkzt/ptjnj/year2013/index2013.html> (accessed April 18, 2015).