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## Laurier professor collaborates with doctors in Wuhan, China on at-home monitoring system for COVID-19 patients

WATERLOO – As the potential for a second wave of COVID-19 looms in Canada, an associate professor of marketing at Wilfrid Laurier University has collaborated with doctors in Wuhan, China to test a telemedicine system for coronavirus patients that relieves pressure on health-care systems. The research team [published its promising results](#) in the *Journal of Medical Internet Research* in early July.

[Chun \(Martin\) Qiu](#), who teaches in Laurier's Lazaridis School of Business and Economics, lent his mobile marketing expertise to the study, which during the peak of the pandemic in China utilized the popular Chinese smartphone app WeChat to establish two-way communication between a multidisciplinary medical team and 188 patients sent home by physicians to self-isolate after showing mild COVID-19 symptoms. The patients self-reported their symptoms every day on a cloud-based online form available to the medical team at Tongji Hospital in Wuhan, where staff successfully identified six patients who progressed to critical condition and hospitalized them in time to receive treatment. Of the 74 study participants confirmed to have COVID-19, all have since recovered.

"The value of this system is to detect meaningful changing or persisting patterns of symptoms during home quarantine and to intervene when needed," said Qiu, who began working on the study in February. "The six patients who progressed to critical condition didn't show any different signs during their initial clinic visit, which is the problem – it's like a lottery. Yet instead of hospitalizing all 188 patients at a time when hospital beds were scarce, the telemedicine system required a small investment of time from just seven medical staff. It also prevented cross-infection, which was really helpful during the peak of the outbreak."

The idea for the study originated with a group of doctors in the departments of anesthesiology and emergency medicine at Tongji Hospital. They approached Qiu, a high school classmate of one of the lead doctors, to help them improve their novel telemedicine system and analyze data to identify trends.

"I grew up in Wuhan and when the pandemic started in January, my friends who still live and work there as doctors were working on the frontlines and concerned about hospital capacity and equipment shortages," said Qiu. "I research and teach mobile and big data marketing, so I helped them construct the proper mobile interface design for information transmission. One tricky part was providing incentives for patients to voluntarily update their conditions continuously for at least two weeks. I had to call upon my knowledge of consumer psychology."

In addition to collecting information about vital signs, Qiu encouraged the research team to add questions about psychological well-being to the daily tracking tool in order to collect a bigger-picture view of patients' conditions. He attributes the use of social media as a critical factor in the system's success, as the WeChat user base in China is so large that it served as an easy, intuitive reporting tool.

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Qiu and his collaborators are eager to share their results with the broader medical community in order to inform COVID-19 treatment practices moving forward. Through their data analysis of hospitalized versus non-hospitalized patients, for example, they found prolonged persistence of fever, shortness of breath, lack of strength and muscle soreness to be indicative of a need for hospitalization.

“In case of another wave of COVID-19, we are better prepared because of the lessons we’ve learned,” said Qiu. “I believe there are applications for this model all over the world that can help reduce the burden on hospitals. We had just seven medical staff in charge of 188 possible COVID-19 patients, and every patient is still alive.”

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