Thesis Project Portfolio

Optimization of Patient Flow and Process for a Primary Care Clinic During the COVID-19 Pandemic

(Technical Report)

The Sociotechnical Factors Behind the Rising Tension Between Doctors and Patients in China

(STS Research Paper)

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Sociotechnical Synthesis

Growing up in China before coming to the U.S. for high school, I have accumulated some perspectives on the health care system including going to the hospital myself in both countries. Regardless of the differences in many things including culture and political systems between the two countries, it is clear that neither has a "perfect" health care system. Instead of comparing and arguing which one is better and to what extent, I believe it would be more beneficial to lay out the pros and cons to study from each other. There are many spaces in both systems for improvements and optimizations, becoming better than its current state is what matters the most to the people and our society. My family has a lot of experiences visiting the hospital, unfortunately, my mom has Meniere's Disease, and my sister has a congenital cataract. The experiences they had with the health system also become a big part of the motivation of my research in this field. Thus, the motivation led me to the two research projects "Optimization of Patient Flow and Process for a Primary Care Clinic During the COVID Pandemic" and "The Sociotechnical Factors Behind the Rising Tension Between Doctors and Patients in China".

Suite 2100 within the University of Virginia (UVA) Health System contains the University Physicians Clinic (UPC). UPC shares the suite with two other clinics, along with the same central pre-registration desks upon building entry. All three clinics share the same check-in desk, resources, and patient waiting area and are facing similar patient throughput inefficiencies. Many of these issues are the result of lackluster communication, broken understandings of systems to maximize efficiency, and long-term challenges and impacts caused by the COVID-19 pandemic. The challenges brought on by the COVID-19 pandemic, combined with the need to provide safe, high-quality care to patients, exacerbated existing patient flow and throughput issues. The overarching goal of the project is to improve the patient experience in the Suite 2100 clinics and reduce the stress placed on staff, nurses, and providers.

The implementation of a two-phased approach combining qualitative observations with quantitative data analysis to provide structured recommendations to stakeholders. Through qualitative clinic observations, the team formulated a partial understanding of a typical patient's journey through the system: pre-registration, check-in, and rooming. However, the quantitative analysis encompassed the entire patient experience, including appointment durations and check out. All quantitative analyses relied on data from UVA Health's electronic medical record (EMR) system, Epic. Relevant data included appointment scheduling and Cadence timestamp data to provide information on key milestones during patient visits. The research team observed three primary, system-wide elements that were contributing to throughput inefficiencies and staff challenges: the inconsistent "dotting" system within Epic, confusing and fragmented signage in the clinic, and the lack of physical signifiers to guide clinic patients through the space. The team then made suggestions to address these issues accordingly.

Even though China has developed rapidly over the past few decades, studies and data revealed that the doctor-patient relationship remains a large domestic issue. In China, the satisfaction of patients would be a life-or-death matter. Back in 2006, China's Ministry of Health showed 9831 'grave incidents' from medical disputes with 5519 injured medical staff, with 200 million RMB (more than 29 million dollars) of property damage. The issue has only become

worse with time. In September 2011, a doctor was stabbed 17 times because the patient was not satisfied with his treatment for throat cancer; in 2013, a patient in Wenling attacked 3 doctors, and one of them ended up dead. In 2014, a nurse in Nanjing was paralyzed, a doctor in Hebei's throat was cut, and a doctor from Heilongjiang was beaten to death by patients (Chen, 2020). This STS paper analyzed studies regarding doctor-patient relationships, explored related trends, and concluded the causes of such contradictions. SCOT and the Wicked Problem frameworks are used to support the research topic. The outcome reveals that the deterioration of doctor-patient relations has various and comprehensive reasons, mostly coming from medical workers, patients' families, and patients. Reasons include government regulations, media, and the social environment. The research can help address the countermeasures for improving the current situation, such as increasing government investment, enhancing staff training, improving hospitals' cultural environment, setting up departments specifically for solving medical disputes, optimizing the quality of facilities, and making the media input more positive impact on the society.

Working on both projects simultaneously has been very beneficial to me, and I could not have gained such value if I were to do them separately. Taking an insightful look at the doctor-patient relationship in the Chinese health system while working on systems improvement in an American hospital setting provided me with comparison and the observation of evident differences between the two. The U.S. healthcare system is much more advanced as the current needs for improvements are considered at the level of operation and design, which is much more trivial and less important compared to the Chinese system. That is because the fundamental things such as the political/legal system, resources, and professionalism of the medical care system have already been well developed and very mature in the United States. In contrast, the problems for the Chinese healthcare system are still at the level of medical resources, efficiency, quality of patient visits/treatment, and even corruption.