Feasibility study for implementation of the AI-powered Internet+ Primary Care Model (AiPCM) across hospitals and clinics in Gongcheng county, Guangxi, China

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Abstract

Background **The sustainability of the rural health-care system is under pressure in Gongcheng county, Guangxi, China, mainly owing to disparities between rural and urban medical resources, and preference of local patients to seek health care in urban tertiary hospitals. Our aim is to reform the county's primary care model to improve rural health-care services and increase its use, a critical component of the current national health-care reform plan. In this study, we primarily test the feasibility of implementing artificial intelligence (AI) powered bidirectional referral between rural clinics and the county hospitals on a new internet-based platform. We focused on developing the new web platform and primary care model and implementing it throughout the whole county health system, which serves over 300 000 residents.**

Methods **Our reform adopts the University of California, San Francisco primary care model augmented with AI on a cloud platform. The main county hospital of Gongcheng county, Guangxi, China, and its associated rural clinics used the AI-powered Internet+ Primary Care Model (AiPCM) platform to provide patient education, patient engagement, bidirectional referral, panel management, and health coaching. The aim was for the three-level county health-care system to operate seamlessly and cost-effectively. In conjunction, the second key innovation required to make AiPCM work in rural China was deployed; an online health-care team from Guilin Medical University provided support to rural doctors in the form of professional training, online support, and a chatbot to assist village doctors in making referrals and managing the health care of rural residents.**

Findings **We developed a new web platform to smoothly integrate AiPCM into existing clinical workflows at county, town and village levels. The main county people's hospital, two town health centres, and 17 village clinics joined the web platform in the first phase of the pilot study. The internet-based hub and spokes model allows the main county hospital (hub), and town health centres and village clinics (spokes) to care collaboratively for patients through bidirectional referral mechanisms. County hospital teams focus on diagnosis and treatment of patients referred from town health centres. Town health centre teams provide panel management for patients at risk and refer patients to county hospitals when needed. Village clinic doctors engage villagers and refer patients to town health centres when needed. County hospital specialists provide feedback to the referring doctors for them to continue caring for the patient locally. As care data are collected, a chatbot can be trained to further assist village and town doctors to make referrals and provide initial primary care. The AiPCM cloud platform can allow Guilin Medical University teams to add more capabilities to the county health system, including doctor training, patient coaching, referral assistance, chatbot training, and patient education. Thus, it is feasible to use AiPCM on a web platform to effectively implement bidirectional referrals, which should encourage more patients to see local doctors.**

Interpretation **With AiPCM and technical support from academic institutions, the new primary care model can be implemented in rural China. Next, we will evaluate the effectiveness of AiPCM, its effect on the number of rural residents receiving the health care that they require, and patient clinical outcomes.**

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Contributors
AC designed the model and platform, and managed the project. ZZ provided strategic leadership and QL provided management leadership in the Gongcheng health-care reform. WJ led implementation of the health-care reform in hospitals and clinics. QZ coordinated implementation of the model in the county hospital. ZH coordinated implementation of the model in town and village clinics. HC assisted hospitals and clinics to implement the model and use the platform, coordinated the professional training effort. RH designed platform functions, managed the medical knowledge base, and provided platform support. H-ZQ contributed to the study design, conducted program evaluation, and performed data analysis and interpretation.

Declaration of interests
We declare no competing interests.

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