The uneven reaction to combat the COVID-19 pandemic: Geovisualizing of fever clinics in mainland China

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Abstract

The COVID-19 pandemic has exerted unprecedented impacts on the world. Since its onset, China has established a network of fever clinics as an effective strategy to aggressively isolate and screen possible patients with COVID-19 symptoms. This study presents two fever clinic maps that visualize the uneven responses to the COVID-19 pandemic at the city level in mainland China. The maps highlight more resources in the southwest, northwest, east, and south China, and paucity in the far west parts of southwest and northwest China and in the north and northeast China.

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Since the outbreak of COVID-19 in Wuhan, China, in December 2019 (Wu et al., 2020), China has established a nationwide network of fever clinics to aggressively isolate and screen possible patients with COVID-19 symptoms. Diagnosed patients are then transferred to designated hospitals for treatment. The first identified cases of outbreaks in Beijing, Shanghai, and Dalian in June 2020 were all detected in these fever clinics. The information on the fever clinics is scattered on websites of various local governments and other public health organizations. The study creates a fine-grained geocoded dataset of fever clinics in mainland China (ended on Oct 28, 2020), calculates fever clinics in absolute numbers and per capita for each city, and visualizes the spatial distribution patterns.

The basic data consist of three parts: (1) 16,511 fever clinics, extracted from the official websites of Chinese government agencies authorized to designate fever clinics in hospitals, (2) population data from the China Statistical Yearbooks Database, and (3) spatial data for base maps from the Resource and Environment Science Data Center.

As shown in Figure 1, fever clinics are far from evenly distributed across cities in mainland China. In China, "city" (shi), precisely prefecture-level city, is an administrative unit below province
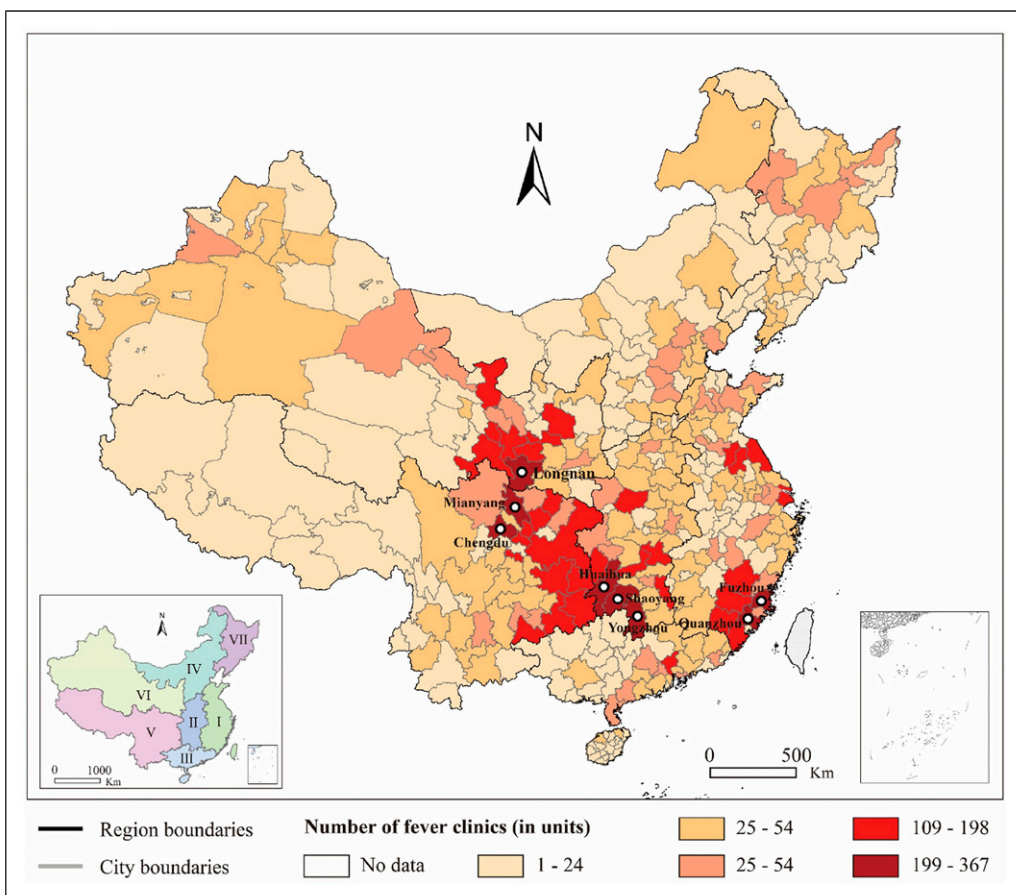
Figure 1. Number of fever clinics by city unit in mainland China.

(sheng) and above county (xian). The inset in Figure 1 shows the seven regions indexed from I to VII. Cities in the Central (II), Southwest (V), and Northwest (VI) regions, and some in the East region (I) have the most fever clinics in response to COVID-19, such as Huaihua, Chengdu, Shaoyang, Mianyang, Longnan, Quanzhou, and Fuzhou. Most cities in the South (III), North (IV), Southwest (V), Northwest (VI), and Northeast (VII) regions have relatively fewer fever clinics. This is compatible with the number of hospitals established by the city governments.

Fever clinics in absolute numbers and per capita (per 10,000 people) resized and colorized the cities in Figure 2, respectively. In cartography, cities with more fever clinics are represented by larger areas. The figure depicts that the cities with more fever clinics tend to with a high per capita number. There are also cities with fewer fever clinics, but many more per capita. For example, cities in Hainan province have set up far more fever clinics relative to their small population (10.12 million) because of the potential import risk from the large influx of tourists (64.55 million). According to Gao et al. (2022), 70% of Hainan confirmed cases were imported by October 30, 2020. The cities in the far west parts of southwest and northwest regions and also the north and northeast regions report fewer fever clinics per capita. Therefore, these areas would need to beef up the infrastructure by designating more fever clinics to combat COVID-19 effectively, as these areas are
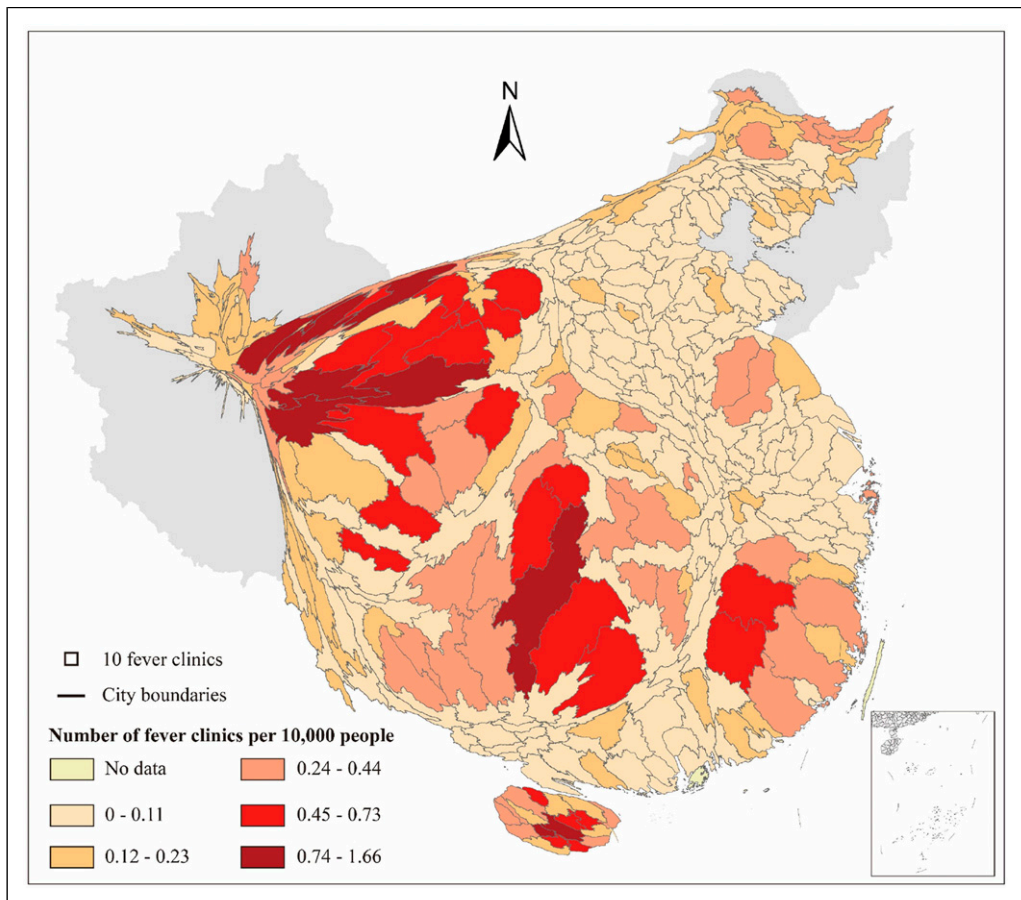
Figure 2. Combined cartogram of fever clinics in absolute numbers and per capita.

less affluent and tend to experience higher infection and mortality rates (Bambra et al., 2020; Liang et al., 2020).

Overall, the response in combat against the COVID-19 pandemic has been uneven in mainland China in terms of designating fever clinics. Policymakers need to strengthen the infrastructure especially in less developed regions.

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