Fighting Coronavirus at Home:

Visualizing “Slammers” for the Extended Spring Festival Break in China

Abstract:

The beginning of 2020 has seen coronavirus spreading to many countries and regions. To contain the virus, China adopted, arguably, the most stringent quarantine countermeasures in the country’s history concerning restricting people flows, limiting outdoor activities, and extending the Spring Festival break. On the one hand, thousands of doctors and nurses directly fought and are still fighting coronavirus in various medical facilities; on the other hand, millions and even billions of residents and tourists self-quarantined and are still self-quarantining themselves in their homes (or temporal homes), fighting the virus in another manner. Across cities and regions, which have the highest percentage of “fighters” at home? To answer to this, we downloaded and processed the publicly available Baidu Qianxi (migration) data for eleven consecutive days in 2019 and 2020. Then we geovisualized the answer. The visual indicates that several cities in Hubei, as expected, had the highest percentage, followed by several cities in Zhejiang Province and several cities in Guangxi Zhuang Autonomous Region and Hainan Province. In terms of percentage ranking across regions, East China is no.1.

Key words: Coronavirus; Self-quarantine; Distribution; Visualization; China

The beginning of 2020 has seen coronavirus spreading to many countries and regions. To contain the virus, China adopted, arguably, the most stringent quarantine countermeasures in its 5000 years’ history concerning restricting people flows, limiting outdoor activities, and extending the Spring Festival break. On the one hand, thousands of doctors and nurses directly fought and are still fighting coronavirus in various medical facilities, especially those in Wuhan, Hubei Province, where is considered as the origin of the earliest virus inflection case and as the epicenter of the reported virus inflection cases; on the other hand, millions and even billions of residents and tourists self-quarantined and are still self-quarantining themselves in their homes or temporal homes, fighting the virus as “slammers” in another “battlefield”.

Across cities and regions, which have the highest percentage of “fighters” at home? To answer to this, we downloaded and processed the publicly available Baidu Qianxi (migration) data between January 29 and February 8, 2020 and February 9 and February 19, 2019. We chose data of those eleven days in the two years because they were the no. 5 to no. 15 days in the two lunar years, respectively. Traditionally, young/new dwellers in Chinese cities travel back to their respective hometowns and enjoy the last day and the first several days in the lunar year with their (elderly) family members. After that, they will go back to where they currently reside or work, which mostly occur between no. 5 to no. 15 days in the lunar year.

Baidu Qianxi (migration) data measure both incoming migration and outgoing migration at the city level. The internal version of these data available to Baidu analysts shows absolute numbers of incoming migration and outgoing migrants. But the external version available to the public, however, only shows some average percentage of all the incoming or outgoing migrants for a given period, e.g., City X's outgoing migrants account for Y% of outgoing migrants in the nation.

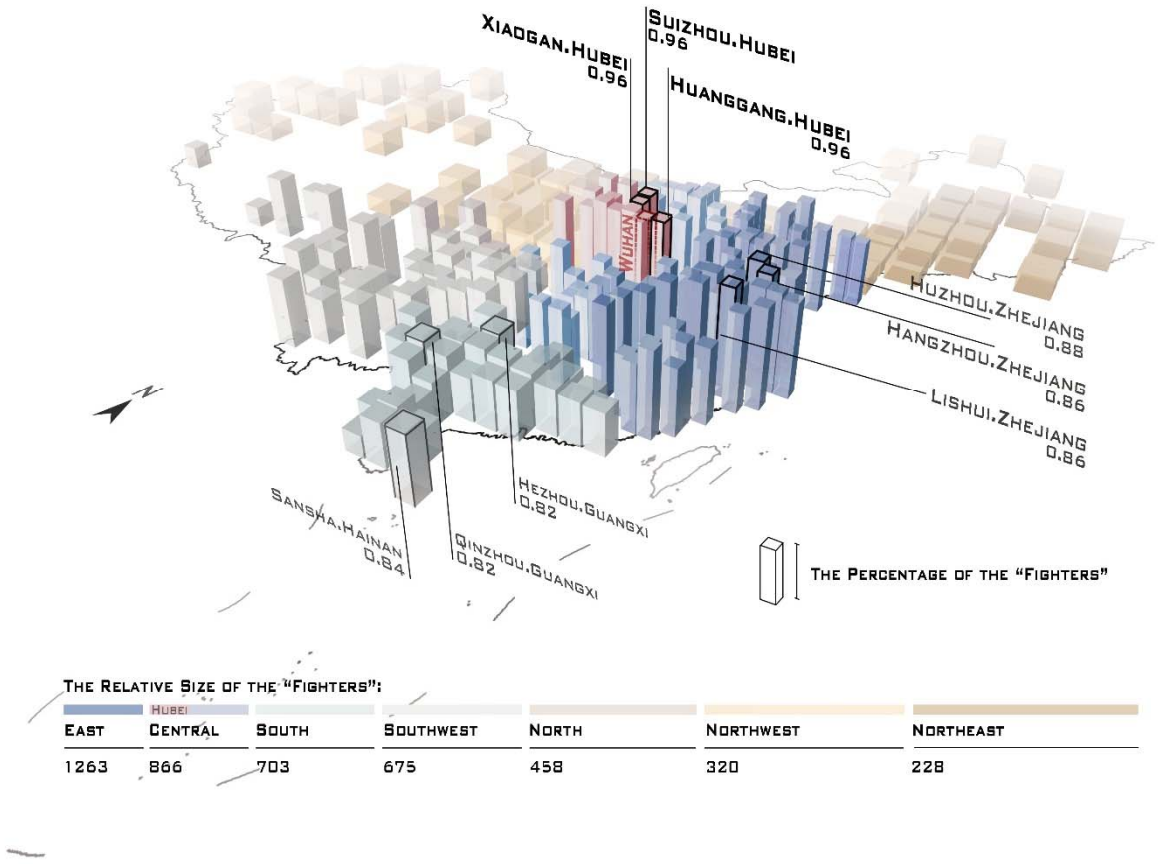

Figure 1: Coronavirus "Fighters" at home by City and By Region in Mainland China

In Figure 1, we used the differences in the Y%'s in 2019 and 2020 to measure how much a city's population did not travel outside the city between no. 5th to 15th days in the lunar year. Such differences can be regarded as an index measuring the relative size of the "fighters" for a given city. The visual indicates that several cities in Hubei had the highest indices of the "fighters", followed by several cities in Zhejiang Province and several cities in Guangxi Zhuang

Autonomous Region and Hainan Province. The vast Northeast China, which is relatively far away from Hubei, saw the lowest indices. Some of the above findings are consistent with our expectations whereas others aren't. Specifically, those cities in Hubei topping the list conform to our expectations. However, the findings about cities in Zhejiang, Guangxi, and Hainan were more or less a surprise to us. These cities/provinces are not among those that generate the highest percentage of outgoing migrants in China (Chan, 2013; The Economist, 2018). Instead, Hainan has been a popular tourist destination during the Spring Festival break in the past few decades. In addition, East China saw higher indices of the "fighters" than six other regions in China. Traditionally, East China as a whole is a magnet for outgoing migrants rather than a region sending out migrants into other regions (Chan, 2013; The Economist, 2018).

All in all, our work/visual indicate that publicly available data compiled by IT giants such as Baidu can be used to answer many intriguing questions concerning our fight against coronavirus, which has been increasingly globalized.

Software

Kepler.gl; Photoshop CS 5.

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Reference

Chan, K. W. (2013). China, internal migration. The encyclopedia of global human migration. *Blackwell Publishing Ltd.* Retrieved April, 24(2004), 571-594.

The Economist (2018). Regional China: internal migration. Available at: http://country.eiu.com/article.aspx?articleid=1326926316&Country=China&topic=Economy (accessed 7 March 2020).