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Letter to the Editor

Effect of home isolation on domestic violence and divorce in China during COVID-19 pandemic

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Dear editor

In the global fight against COVID-19, scholars have pointed out the health benefits of various non-pharmaceutical interventions, such as travel ban and home isolation. However, these policies also impose large costs on society (Hsiang et al., 2020). Governments and people are considering whether the health benefits are worth the social and economic costs. Therefore, assessing the costs of implementing the control measures is essential, and this study is a vital component of this aspect.

The study aims to examine whether home isolation policy deteriorates the family relationship in China, increasing domestic violence and divorce. Domestic violence denotes aggressive, hostile, and violent behaviors that occur within families, which may be psychological, emotional, physical, or sexual (Pacheco and Rudas, 2021). Even before the COVID-19 pandemic, China displayed an alarming rate of the prevalence of domestic violence in the general population, which could reach 65% (Zhang, 2020). Scholars reported that domestic violence is closely related to divorce (Bowlus and Seitz, 2006). In 2018, the Supreme People's Court of China reported that since 2003, the divorce rate in China has gradually increased across 15 consecutive years (Zhang, 2020). Therefore, if home isolation can worsen these traditional situations, then it will undoubtedly impose great burdens on society.

With the development of the Internet, people have become accustomed to seeking related information in the face of family relationship problems. This online search behavior generates large-scale rich data, which provides an approach to overcome the limitation of the availability of data on domestic violence and divorce. Therefore, we conducted an analysis based on online search data from Baidu, the biggest search engine in China (see "Materials and Methods" in Supplementary Information for details). We collected daily data from the Baidu Index for "domestic violence" and "divorce" at the city level between January 1, 2020, and March 7, 2020. Information on home isolation, which was

defined as a policy that limited residents from leaving their homes for non-essential activities, was obtained from various news reports. To estimate the causal effect, a difference-in-differences (DiD) approach was employed. The treatment group was defined as cities implementing home isolation, whereas cities without this policy served as the control group. Propensity score matching (PSM) was used to reduce bias between the treatment and control groups, which enabled accurate comparisons.

Using the comprehensive data and rigorous statistical methods, we found that home isolation led to an increase in the online search for "domestic violence" and "divorce", although the effect was observed two or three weeks after the policy implementation. This finding was obtained after introducing city and date fixed effects in the model. Therefore, we can control for time-invariant confounders specific to each city (e.g., short-term economic level and geographical conditions) and shocks common to all cities on a given day (i.e., the Chinese Spring Festival). Details about the results are reported in the "Results" part of Supplementary Information. The underlying mechanisms of the finding could be explained from three major perspectives. First, COVID-19 and subsequent control measures disrupted the rhythms of life, work, and entertainment, which could increase psychological problems and, thus, lead to increased conflicts within families during the pandemic (Yang et al., 2021; Zhu et al., 2021). Conversely, exposure to conflicts, such as violence, can exacerbate mental health conditions, which forms a vicious cycle and breaks family relationships in a repeated manner (Mazza et al., 2021). Second, home isolation may force victims to spend more time with abusers of domestic violence and create added opportunities for conflicts to worsen family relationships (Zhang, 2020). Third, the home isolation policy required people to stay at home. Thus, they were less likely to obtain traditional offline social support and assistance when faced with family relationship problems. Therefore, people opt to seek help and search related information online, which

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increased the search volume. Future studies are required to confirm and quantify these mechanisms and explore other potential causes.

The novelty of this research is mainly focused on the data and statistical methods. First, obtaining the daily number of domestic violence and divorce cases is difficult, especially for city-level data, which may be a reason for the limited empirical evidence about this topic in China. Moreover, related events reported by Chinese media and regional organizations are less likely to cover the majority of all events. To address this problem, we used the online search data as an approximation of the level of domestic violence and divorce because people tend to search online when faced with related problems. Furthermore, the COVID-19 pandemic and control measures nearly coincided with the Chinese Spring Festival. This national holiday could aggravate family conflicts, and researchers found that the divorce rate within one month after the Spring Festival can be two times higher than usual (Zhang, 2020). Thus, identifying the causal impact of home isolation policy is difficult merely through a before and after comparison. This study employed the PSM-DiD method to overcome this challenge and provide inference on the causal relationship.

In summary, our study suggests that home isolation during the COVID-19 pandemic may worsen family relationship in China, which imposes burdens on society. When implementing this type of policy, the costs on families should be considered. The government should provide timely online services to meet the increasing demand for help from couples and families due to the unavailability of offline support during lockdown periods (Marano et al., 2021). Notably, our study is founded on the unique Chinese economic, cultural, and social contexts. Therefore, the findings in other communities or countries may be different, which requires additional studies on other areas. We believe that the findings of our study, together with future research, will assist in understanding the socioeconomic costs of the control measures for COVID-19 and provide useful implications to policymakers when formulating strategies for this type of sudden public health event.

Ethical statement

This article does not contain any studies with animals performed by any of the authors. It does not require approval. All data were obtained from publicly available sources.

Declaration of Competing Interests

The authors declare no competing interests.

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

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