Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Associations between phone mobility data and COVID-19 cases

Understanding factors that affect the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is crucial for mitigating the impacts of COVID-19. Hamada Badr and colleagues[1] found a strong correlation between phone mobility data and decreased COVID-19 case growth rates, making the explicit assumption that phone mobility data serves as a proxy for social distancing. Thus, if true, concomitant increases in mobility will be correlated with an increased number of cases. We did a similar analysis using three social distancing metrics created from phone mobility data provided by the Unacast Social Distancing Scorecard.[2] The first metric—the daily distance difference—is analogous to the mobility ratio metric calculated by Badr and colleagues. The mobility ratio metric quantifies changes in behaviour relative to a baseline period before widespread transmission of COVID-19. The other two Unacast metrics measure changes in visits to non-essential places and encounter density, which were noted as limitations in the study by Badr and colleagues.

Using the daily distance difference metric, we identified a strong correlation between decreased mobility and reduced COVID-19 case growth between March 27 and April 20, 2020 (appendix). The other two metrics showed similarly strong correlations (data not shown). However, when we extended the analysis to later time periods (April 21 to May 24, 2020, and May 25 to July 22, 2020) only a weak correlation between daily distance difference and COVID-19 case growth was identified (appendix). In the first time period, when each metric was decreasing, the correlation across all counties was around 0·6. However, as the metrics increased in later time periods, consistent with reductions in social distancing, the correlation decreased to 0·11 or less for all three metrics.

Our results suggest that mobile phone mobility data only captured a small component of the behaviours associated with social distancing that reduced transmission of SARS-CoV-2 in the early stages of the pandemic. The absence of a strong correlation between mobility and case growth after the initial phase of the pandemic suggests that other individual level factors, such as wearing a mask or maintaining distance even when encountering individuals, are likely to be more important than mobility alone. Additionally, overdispersion identified in the distribution of transmissions suggests that a small number of individuals are likely to account for a large proportion of transmission.[3] Thus, limiting gatherings of individuals, which might not be fully captured by phone data, might be responsible for reducing the number of new infections by reducing so-called superspreading events. Notably, the reductions in transmission were strongly correlated with seasonal changes that are consistent with transmission reductions of most respiratory pathogens.[4] Differentiating the distinct causes of transmission will be crucial for the development of policies at local and national levels as the virus continues to spread widely. Although robust literature suggests individuals will increase social distancing as the number of COVID-19 cases increase,[5] a better understanding of transmission will aid individuals in making informed decisions to reduce the spread of SARS-CoV-2.

See Online for appendix

We declare no competing interests.

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