# Real-time crowding information can help contain COVID-19

As long as an effective medication and vaccine are still being developed, physical distancing is one of the most potent means to curb the spread of COVID-19. Therefore, many policymakers recommend or even fiercely enforce physical distancing of their citizens through lockdowns and curfews to ensure compliance. The prevalence of enforced physical distancing reached unprecedented levels when in March 2020 almost one in every five people around the globe were placed under lockdown (Davidson, 2020). In sum, physical distancing has become an unwanted but needed global practice, opposing the social nature of humans and thus – if enforced – embodying undesired paternalistic infringements of citizens' freedom of choice.

To assist users in identifying and selecting less crowded options and thus to facilitate physical distancing without restricting citizens' personal freedom, apps (and websites) increasingly display crowding information, which we define as information that indicates to what extent a location's available capacity for visitors is occupied. For example, the website *DocClocker* informs patients how exposed they are to other patients at different doctors, the app *Crowdless* shows which supermarkets are currently crowded and the popular times feature of *Google Maps* displays how busy locations (e.g. restaurants and bars) are (see Figure 1). By employing crowding information, apps make the different crowding levels at real-world locations digitally visible and thus allow users to identify differently crowded locations. As such, apps can potentially facilitate physical distancing by displaying crowding information, and therefore provide an important contribution to the containment of the COVID-19 pandemic.

Figure 1. Crowding information provided by *Google Maps* with usual crowding based on historical visits (left) and live crowding information reflecting current visits (right)
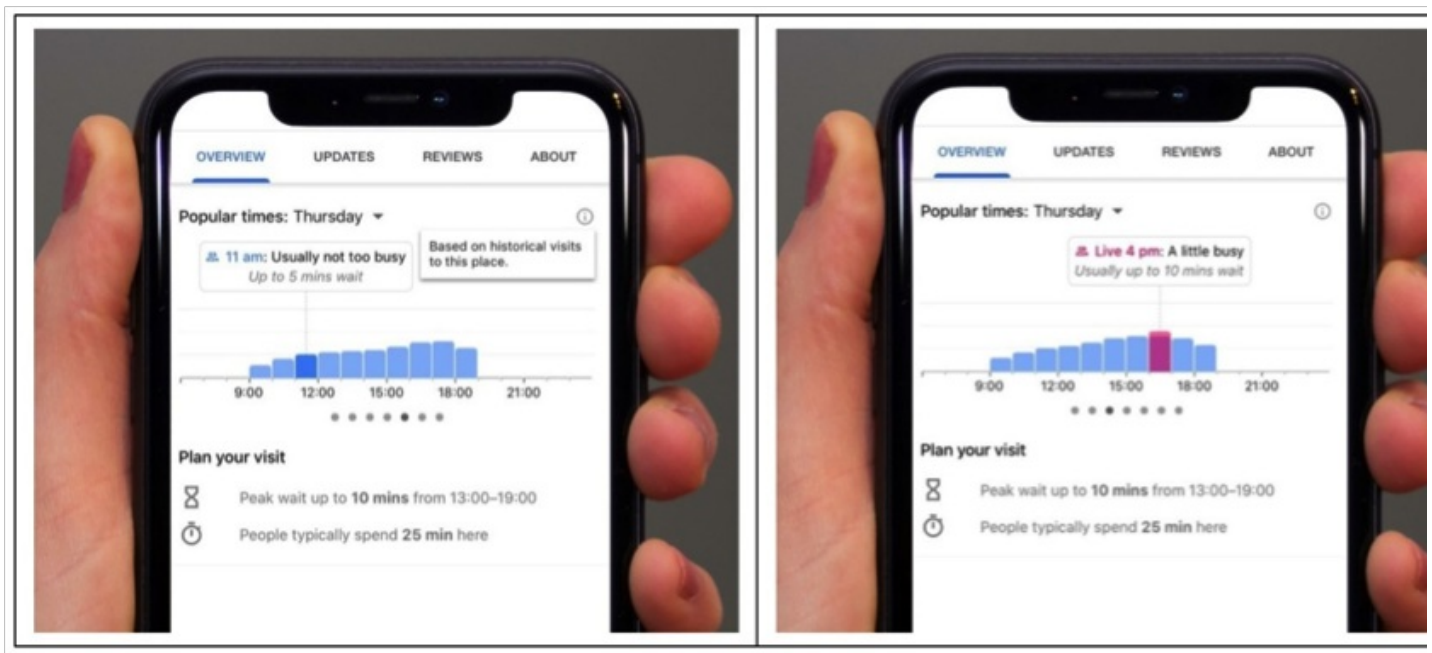
Although apps increasingly display crowding information about locations, knowledge is lacking whether and how this indeed influences (user) selection behaviour. Specifically when users are uncertain about the quality of each location they face a dilemma when interpreting crowding information. Given the COVID-19 pandemic, more crowded locations entail a heightened risk of infection through increased encounters and congestion. Yet, previous knowledge related to crowding information mainly indicates that individuals are attracted to highly demanded and thus often crowded locations because this is interpreted as a signal of high quality. Therefore, a troubling question arises: If users are attracted to crowded locations, do apps that display crowding information in good faith unintentionally make users select more crowded locations and hence add fuel to the fire of spreading COVID-19?

To address this concern and shed light on the effects of crowding information on containing COVID-19, we conducted a multinational experiment in Germany and Italy in which participants selected between differently crowded medical practices. Our results demonstrate that displaying (vs. not displaying) crowding information increases the likelihood of users selecting less crowded medical practices, such that users are 4.6 times as likely to select less crowded options. Moreover, this effect is stronger with timelier crowding information (i.e., real-time crowding information).

By uncovering how displaying crowding information shapes selection behaviour, our findings offer pragmatic insights and actionable implications for app providers and policymakers to achieve an immediate impact on containing the COVID-19 pandemic. Particularly, our study highlights crowding information as a powerful tool to facilitate physical distancing by endowing citizens with information to identify and select less crowded places. In the past, policymakers mainly focused on whether or not it is necessary to enforce physical distancing through traditional paternalistic interventions like lockdowns and curfews as ultima ratio. Our insights now provide a more liberal, state-of-the-art solution that supports users in their physical distancing efforts without infringing their personal freedom of choice. Consequently, app providers who display crowding information in general, and highly immediate crowding information in particular, enable a self-regulating mechanism for users to unwittingly contribute to the containment of COVID-19, thus complementing and partially mitigating the necessity of paternalistic governmental interventions. Moreover, this approach not only helps to safeguard civil rights, but also allows policymakers to avert economic loss, such as from forcing service providers to (temporarily) close shops. Moreover, while this risk containment is particularly relevant to control pandemics like COVID-19, it can also serve to curb the spread of other infectious diseases (e.g. the seasonal flu). Thus, our findings are valuable to protect individuals within and beyond the context of pandemics.

Overall, our research indicates that app providers and policymakers are well-advised to endow users with timely information to identify and select less crowded locations, thus containing COVID-19 through improved physical distancing without paternalistically restricting users' freedom of choice.

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Notes:

- *This blog post is based on Adam, M., Werner, D., Wendt, C., & Benlian, A. (2020). [Containing COVID-19 through physical distancing: the impact of real-time crowding information](). European Journal of Information Systems, 1-13.*
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