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Human Kinetics

COVID-19 Highlights the Potential for a More Dynamic Approach to Physical Activity Surveillance

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The emergence of severe acute respiratory syndrome coronavirus 2, has urged the scientific community and industry to obtain population snapshots of lifestyle behaviors to characterize changes in behaviors during relatively short windows of time (e.g., weekly) so that the impact of lockdowns and other related public health measures could be assessed. Consumer device companies have taken the lead with wearables, tracking ambulatory movement worldwide by harnessing the data from their millions of users and exemplified how it can be used to monitor trends. In March 2020, Fitbit reported steps per day dropped by −7% (Germany) to −38% (Spain) in the week restrictions were brought in (Fitbit, 2020b). In October 2020, steps and number of "active minutes" remained down; however, the intensity of "active minutes" and duration of sleep had increased (Fitbit, 2020a). Garmin also mined the data of their users, reporting that while steps per day decreased steeply when restrictions started, they did start to pull back over the following months (Garmin, 2021). Smartphones with built-in accelerometers, similarly, have potential for widespread monitoring of physical activity. Notably, in 2017, Althoff et al. (2017) used smartphone data to compare activity across 111 countries in >700,000 people.

Consumer devices tracking physical activity have been around for a while now, but the pandemic has made it perhaps clearer than ever that these devices might have an important role capturing multiple snapshots of ambulatory movement and physical activity in large groups of individuals. Thus, a snapshot of physical activity, as typically obtained in national/international surveys, can be complemented by long-term, more dynamic assessments as generated from these tools. Such data would not only inform the planning of future pandemic control measures but, further be valuable in monitoring the impact of other artificial interventions, for example, changes to the built environment and/or green space, and examinations of activity/ sleep patterns across multiple countries.

However, the application of consumer devices in the context of physical activity surveillance comes with multiple challenges. For example, wearable users are not representative of the wider population and studies have demonstrated that wearable users are notably younger, fitter, and from higher socioeconomic backgrounds (Pontin et al., 2021; Strain et al., 2019). Two insightful commentaries in this issue ask whether consumer devices could be appropriate for population-level surveillance of physical activity (Mair et al., 2022; Strain et al., 2022). In the first commentary, Mair et al. (2022) discuss the potential benefits and limitations of using consumer devices to understand population physical activity patterns across a number of different study designs, and suggest that leveraging access to retrospective data presents a unique opportunity, especially in response to natural events. In an invited response to Mair et al. (2022), Strain et al. (2022) focus on the limitations specifically for population-level surveillance and examine four key issues to tackle before inferring population level of activity from consumer devices. If consumer devices are appropriate for use for in population-level surveillance, then this could facilitate surveillance of other physical behaviors (e.g., purposeful activity/exercise sessions and sleep). However, while the use of consumer devices for surveillance appears very attractive, there are important challenges with this approach.

Acknowledgments

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