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Pandemic and post-pandemic mobility and contact patterns in Berlin - preliminary results

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The COVID-19 pandemic has clearly shown how unprepared we are globally to adapt and manage effective public health responses in urban context. This pandemic has not only transformed how people navigate urban spaces but also how they physically interact with each other. This study aims to understand these changes in Berlin by utilizing GPS mobile phone data from 2020 and 2022 and performing a comparative analysis of mobility patterns during the pandemic and post-pandemic periods. In particular we study the month of November for each year to minimize external influences, during which we observed significant shifts in human mobility and interactions. Our dataset includes 72,301 records (contacts) among 14,908 mobile phones (individuals) in 2020, and 96,844 records among 11,094 individuals in 2022. Contacts between individuals were recorded when mobile phones were within an 8-meter distance for a minimum of 2 minutes. Our methodology encompasses a range of approaches, including examining the cluster and community structure of the contact network, exploring motifs in how people move between common settings (home, work, and others), and investigating the heterogeneity of people's activities. Using social network analysis, we were able to reveal a change in mobility patterns, with the average nearest neighbor distances being less path-like during the pandemic compared to the post-pandemic period. However, the frequency of motifs remained similar across both periods. This study not only reveals the immediate impact of the pandemic on urban mobility and contact patterns but also contributes to to improvement of response strategies in future crises.

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