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Investigating the relationship between drug use practices and mobility patterns among people who inject drugs in urban environments

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People who inject drugs (PWID) are at a high risk of transmitting blood-borne infection like HIV and hepatitis C due to injection practices. By studying travel patterns as related to drug use behaviors, we may better understand disease transmission spatially. This can inform the development of targeted intervention strategies such as the allocation and locations of prevention and treatment services. In this study, we investigate the relationship between routes of drug administration and human mobility patterns among PWID.
Participants were recruited from the ongoing ALIVE Study, a community-recruited cohort of PWID in Baltimore. Following informed consent, 100 participants were provided a smartphone embedded with a GPS logger and were prompted multiple times daily to complete a survey on drug use behavior. A robust stop-location detection algorithm was applied to 14 million points of GPS data to automatically extract stop locations at which PWID stayed for at least 2 minutes. In total, over 2032 drug use sites were identified, including 714 for snorting, 670 for smoking, and 551 for injecting. Getis-Ord Gi* statistics highlighted significant spatial disparities. Snorting and smoking locations were widespread, covering 86 and 73 block groups, respectively, whereas injecting was more concentrated within 44 block groups. Smoking sites were particularly dispersed, with over 33% located beyond one standard distance from their case-weighted geographic centroid, compared to around 20% for snorting and injecting sites. Our study reveals distinct mobility patterns among drug users by method, offering a potential reference for optimizing targeted interventions.

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