Importance of Place in Examining Risk for Suicide Among Youth

Suicide is the third leading cause of death among young people aged 10–24 years in the United States [1]. Nonfatal suicidal behavior is even more prevalent and results in significant morbidity and risk of suicide [2,3]. The National Action Alliance for Suicide Prevention (Action Alliance) in partnership with the American Foundation for Suicide Prevention set a goal to reduce the suicide rate up to 20% by 2025 [4]. To reach this goal, more effective suicide prevention policies, programs, and practices are needed.

Understanding the role of place in shaping the geographic distribution of suicide is critical to informing appropriate public health responses for suicide prevention. A geospatial perspective of suicide expands the focus beyond the individual and provides public health guidance for action at the community, regional, and/or national level. In this issue of the Journal, the report by Sugg et al. [5] adds to a growing number of state-level studies that have described the spatial pattern of suicide clusters. Using geographically and statistically appropriate methodology and state-of-the-art spatial statistics, this ecological study identified the pattern of spatial clusters for suicide and self-injury in North Carolina for 10-year-olds to 24-year-olds between 2009 and 2018 and assessed differences in individual demographic and contextual factors within these clusters. Suicide deaths were extracted from North Carolina Violent Death Reporting System and death certificates. Self-injury data (which included suicide attempts, suicidal ideation, self-harm, and poisoning) came from emergency department (ED) data from the North Carolina Disease Event Tracking and Epidemiologic Collection Tool. Spatial scan statistics were used to detect high-risk clusters of suicide at the zip-code level.

During the study period, a total of 1,398 suicides and 48,865 ED visits for self-injury occurred. Suicides primarily occurred among non-Hispanic White males, with firearms as the most common method, whereas self-injury was more frequent among females. A total of four significant suicide clusters and 10 significant self-injury clusters were identified; the spatial patterns of suicide and self-injury clusters differed across the state, with some overlap in the southeastern and northwestern parts of the state. Excess risk of suicide was up to 3.6 times higher in suicide clusters than no clusters and excess risk of self-injury was up to 2.3 times higher in self-injury clusters than no clusters. These results have the potential to inform suicide prevention efforts in these high-risk locations.

This study highlighted several important findings from the multivariable analysis. First, communities classified in the most economically deprived group as opposed to the least economically deprived group were more likely to be within suicide clusters and self-harm clusters. This aligns with prior research that suggests communities with higher levels of deprivation and lower socioeconomics have higher rates of and risks for suicide [6–8] and self-injury. These findings suggest that improving socioeconomic conditions may help alleviate suicide and self-injury in young people. Programs that strengthen economic supports, such as improving financial security through tax credits and food security with Supplemental Nutrition Assistance Program (food stamps), have been shown to help improve youth school achievement and future economic success while also improving health [9]. Second, unlike much of the prior research [10–12], the authors found that small towns and rural isolated towns were less likely to be in suicide clusters than large metropolitan areas. Similarly, rural isolated towns were also less likely to be in self-injury clusters than large metropolitan areas. This study’s use of a classification system for the urban-rural continuum that differs from most prior studies, likely due to the different unit of analysis (zip codes vs. county), and the fact that few North Carolina zip codes are captured within the small town and rural isolated categories, may contribute to the different findings. Finally, the residential segregation (Index Concentration of Extremes race) variable the authors chose to use was significant, with predominantly Black communities less likely to be in suicide clusters or self-injury clusters than predominantly White communities, a finding that runs counter to most prior literature using the Index Concentration of Extremes race variable, where Black communities tend to be more
disadvantaged [13–15]. The authors accurately point to the need to examine residential segregation further in relation to suicide.

A major strength of this study is the analysis of both suicide and self-injury clusters occurring in young people. Previous studies have focused almost entirely on identifying suicide clusters and tend to group individuals together across the lifespan rather than examining specific developmental age groups. Thus, this study addresses an important gap in the literature. However, several limitations must also be considered. First, the self-injury variable is problematic because it includes a range of thoughts and behavior that may or may not involve suicide intent; thus, the patterns of self-injury clusters are likely to differ across phenotypes (e.g., suicide attempt vs. self-harm). Second, use of residential zip code as the unit of analysis has its limitations and challenges because they rely on the mail postal system and some areas may not be covered or they may change over time; new ZIP codes may be created or eliminated at any time [16]. They also have no clear boundaries in contrast to the census tract which have well-known boundaries, are aligned with counties, and provide more granularity than zip codes.

The present study adds to the literature, yet major knowledge gaps in our understanding of the association between place and suicide and self-injury remain. Future research is needed that uses national data to examine geographical distributions and correlates of both suicide and suicide attempt clusters, preferably at a more fine-grained geography unit such as the census tract. Moreover, to date, most studies have lacked temporal components and greater efforts are needed to acquire data that measure temporal variation. Spatiotemporal analysis offers additional benefits over purely spatial or time-series analyses because the approach allows investigators to simultaneously study the persistence of patterns over time and space. Finally, the value of spatial analysis would be enhanced by access to real-time data. Currently, routinely collected suicide mortality data at the national level is markedly time-lagged, complicating efforts to precisely identify current spatial clusters. Creation of a system that allows near—real-time tracking of national mortality data, similar to approaches taken for syndromic surveillance of suicide attempts presenting to EDs [17], is urgently needed.

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References