Study ties fire station proximity firmly to prevention of injuries

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Credit: University of Texas at Dallas

Does living closer to a fire station equate to a higher level of safety? It's a commonly held belief, and now Dr. Dohyeong Kim at The University of Texas at Dallas has gathered empirical evidence that does indeed

support that assertion.

"It was unclear if location characteristics relating to the accessibility of fire protection services were risk factors for unintentional residential fire-related injuries in urban areas," said Kim, an associate professor of public policy and political economy in the School of Economic, Political and Policy Sciences. "Our study aimed to measure spatial accessibility to fire protection services at the census block group level and to examine whether it is associated with unintentional residential fire-related injuries."

Kim and his co-researchers—first author Soojin Min Ph.D."18, now a senior research scientist at Boston Medical Center, and corresponding author Dr. Chang Kil Lee, professor of urban policy and administration at Incheon National University in South Korea—published their findings in the online journal *BMJ Open*. The study considered 2,142 incidents that occurred in the city of Dallas between 2012 and 2015. Of those cases, 60 involved injuries or deaths.

"We found that supply did not meet demand uniformly across the city," Kim said. "We discovered that incidents involving injuries were statistically less likely to occur in areas where there was better access to fire stations."

The study used a standardized measure, called a spatial accessibility score, to quantify the capacity of fire protection services calculated as the number of fire engines within 2 miles from each census block group. The measure ranged on a scale of 0 to 20.3; some census block groups have no fire engine within the boundary, while others have more than 20 engines.

According to the study, downtown and areas north of downtown had some of the highest levels of access to fire stations, reaching spatial

accessibility scores of 5.0 to 20.3. Other geographic areas of the city, including the northeast and southern sectors, had lower scores—between 0 and 4.9. In these areas, there were fewer stations or fire engines, and they were farther away from populated areas than their neighbors to the north.

Kim said this information can be crucial for the city in determining where the next fire stations should be built.

"Although this study does not reveal specific causal links between low spatial accessibility to fire protection services and unintentional residential fire-related injury risk, the findings can be useful in contributing to guidelines for city management regarding identifying potential areas that additional fire stations can adequately serve," Kim said. "City leaders can consider the question of residents' distance from fire stations as factors in decisions of building more fire stations, in addition to housing and population."

More information: Soojin Min et al. Association between spatial accessibility to fire protection services and unintentional residential fire injuries or deaths: a cross-sectional study in Dallas, Texas, *BMJ Open* (2019). DOI: 10.1136/bmjopen-2018-023780

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