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Commentary

Civil Engineers and Architects Need to Consider Suicide Prevention When Designing New Structures

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Civil engineers and architects design buildings, bridges, railway stations, shopping centers, recreational centers, schools, universities, etc. Some of these structures may later turn into a suicide location of concern. One of the most famous is the Golden Gate Bridge in San Francisco, which considered to be the most used location for suicide in the world. The deck is about 75 meter high and, after a fall of four seconds, jumpers hit the water at nearly 120 km/h. Ninety five percent of jumpers die immediately from trauma and most of the rest, who survive the trauma, drown or die of hypothermia [1]. Very few people who eventually survive the fall might go on to be advocates for suicide prevention [2]. After many years of debate and argument, suicide proofing of the Golden Gate Bridge is currently in progress but completion is delayed until 2023 [3].

What is the evidence concerning the effectiveness of interventions to reduce suicide risk at locations of concern? Some structural changes have been shown to be successful in reducing suicide cases either totally or partially. For example, Sinyor and Levitt, using a natural experimental design, showed that four years after installation of the barriers over the Bloor Street Viaduct in Toronto, Canada, there were no further suicide cases. However, suicide cases significantly increased at other bridges [4].

Perron and colleagues, using a similar research design, highlighted that, five years after setting up a barrier at Jacques-Cartier Bridge in Montréal Canada, suicide by jumping decreased at this site with slight or no shift to other jumping locations [5]. Similar results have been also reported by Bennewith and colleagues on the positive impact of barriers on the Clifton suspension bridge. Suicide numbers significantly decreased from 8.2 per year (1994-1998) before installing the barriers to 4.0 per year (1999-2003) after their installation [6].

In another natural experimental design, Beautrais studied the negative impact of removing safety barriers from Grafton Bridge in Auckland, New Zealand, in 1996. She found that the number of suicides increased from three (four years before removal) to 15 (four years after removal) [7]. In a further study, Beautrais and colleagues showed that, after the reinstallation of safety barriers in 2003 on the same bridge, there were no further suicide cases up to 2006 [8].

Using a quasi-experimental design, Law and colleagues found that installation of platform screen doors (PSDs) was associated with a significant 60% reduction of railway suicides in Hong Kong. After the installation of PSDs no suicide cases with a psychotic illness were reported [9]. In another study, Gregor and colleagues studied the consequences of installing a corridor barrier in New South Wales, Australia. They concluded that a higher level of corridor barrier was associated with a lower overall rate of suicide by train [10].

Given this robust evidence of the effectiveness of interventions to reduce suicide at locations of concern, civil engineers and architects should consider how to improve safety and reduce suicide risk at locations which have been built without consideration of suicide risk but where there is evidence of repeated suicide and suicide attempts, such as the Golden Gate Bridge. More cogently, we suggest that civil engineers and architects should consider suicide risk and the prevention of suicide when designing a new structure. We go further, and recommend that this important issue should be included within the relevant departmental university curriculum. Civil authorities should also consider suicide risk and prevention when approving the design and funding of any such structures. Better to suicide proof a new structure than build it, let it become a suicide location and then seek to redesign it to make it safe.

Our recommendations apply equally to high income countries (HICs) and low and middle income countries (LMICs). Most evidence about the effectiveness of interventions to reduce suicide at locations of concern comes, as we have seen, from HICs, where there are more resources to support action, while evidence relating to LMICs is largely absent and resources are more scarce. Nevertheless, considering suicide prevention should be given high priority in every country around the world when designing new structures.

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