

Strategies to prevent suicide

D Gunnell^(A1)

professor of epidemiology

M Miller^(A2)

associate professor of health policy and injury prevention

^{A1} Department of Social Medicine, University of Bristol, Bristol BS8 2PR

^{A2} Harvard School of Public Health, 677 Huntington Avenue, Boston, Massachusetts 02115, USA

d.j.gunnell@bristol.ac.uk

Research, doi:10.1136/bmj.c2884

Should target methods that are commonly used, highly lethal, and readily accessible
Suicide is a leading cause of premature mortality in low and high income countries.

Despite this, information to guide prevention strategies is limited. One of the few approaches with a strong evidence base is preventing access to methods that are highly lethal and commonly used in suicidal acts.⁽¹⁾ The rationale for this approach is based in four observations: suicide attempts are often impulsive, crises are often fleeting, prognosis is good after non-fatal attempts (<10% of people go on to die by suicide), and acts are more likely to be fatal when highly lethal methods are used.

Placing barriers on bridges and other sites from which suicide by jumping is common therefore seems sensible. Jumping is highly lethal and deaths are often very public,⁽²⁾ leading to media reporting and possible contagion.⁽³⁾ Reviews and national guidelines have called for safety measures at “suicide hotspots.”^{(4) (5) (6)}

In the linked study (doi:10.1136/bmj.c2884), Sinyor and colleagues describe the apparent failure of the Bloor Street Viaduct barrier in Toronto to reduce suicide by jumping.⁽⁷⁾ They assessed the yearly rates of suicide by jumping at the Bloor Street Viaduct from 1993 to 2001 (nine years before the barrier) and from July 2003 to June 2007 (four years after the barrier). Although the barrier prevented suicides from the bridge—deaths fell from 9.3 a year to zero—this had no effect on the rates of suicide by jumping in the region as a whole (although suicide rates overall fell); indeed, there was a possible compensatory rise in suicides from other bridges.

What do these findings mean for the efficacy of preventive barriers? A few notes of caution are important before abandoning their use at selected sites. Firstly, the relatively small number of suicides from the Bloor Street Viaduct (about 9.3 a year before the barrier; <4% of suicides in Toronto) make it impossible to draw any conclusions about the net effect of the barrier on suicide deaths overall. Secondly, suicides from other bridges may have been increasing in the years before the barrier was erected.⁽⁷⁾ Thus, the rise in suicides from other

bridges may have resulted from an increase in the popularity of bridge jumping rather than substitution. Thirdly, other studies of bridge barriers (with similar sample size limitations) have been more favourable⁽⁵⁾: barriers on the Clifton Suspension Bridge (United Kingdom) led to a halving of deaths from the bridge and a reduction in overall suicides by jumping in the area by males (90% of those who jumped from the Clifton Suspension Bridge before the barriers were put in place were male).⁽⁸⁾ Fourthly, as the authors point out, people who jump from bridges that, like the Bloor Street Bridge, span hard surfaces (rather than water) and do not have the iconic status or aesthetic distinction of the Golden Gate or Clifton Suspension Bridge, may differ from those who jump from iconic sites. Moreover, jumpers may be less impulsive than people who use common suicide methods. Data from the US National Violent Injury Statistics System, for example, show that jumpers are less likely to have same-day crises, such as interpersonal conflicts on the day of the suicide, than people who use methods other than jumping (most of whom die in their homes); this suggests that restricting access to highly lethal household methods may, on average, be more effective.⁽⁹⁾ Lastly, suicide barriers reduce the number of people who witness gruesome, public suicides and the kind of high profile coverage of these violent deaths that may, in turn, trigger additional suicides.⁽³⁾

From a population perspective, with the exception of city states, such as Hong Kong and Singapore, jumping is a relatively rare (<10% total) method of suicide⁽⁴⁾; deaths from specific hotspots are fewer still. If the ultimate goal of means restriction is to reduce the incidence of suicide, the most promising targets are therefore not hot spots, important as these may be, but methods that are commonly used, highly lethal, and readily accessible in or near the home (such as toxic pesticides in developing countries and firearms in the United States).

To be effective in reducing the overall incidence of suicide, however, substitute methods must also be less lethal. Thus the detoxification of the domestic gas supply in the UK, bans on highly toxic pesticides in Sri Lanka, and decreases in household firearm ownership in the United States were followed by marked reductions in method specific suicides and overall suicide rates in these countries.⁽¹⁰⁾⁽¹¹⁾⁽¹²⁾ These reductions occurred because there was limited substitution by other methods, or if substitution did occur, less lethal methods were used. Moreover, these reductions were measurable and significant at the population level because the restricted method accounted for a large proportion of deaths from suicide.

Sinyor and colleagues' study reminds us that means restriction may not work everywhere, that characteristics of the means targeted are important to consider, and that we have much to learn about the determinants of the choice of method in suicidal acts. Yet, where and when means restriction works, it may save more lives than other suicide prevention strategies,

especially in children and young adults, who tend to act impulsively in fleeting suicidal crises.

Competing interests: All authors have completed the Unified Competing Interest form at http://www.icmje.org/coi_disclosure.pdf (available on request from the corresponding author) and declare: (1) No support for the submitted work; (2) No relationships with companies that might have had an interest in the submitted work in the previous three years; (3) No spouses, partners, or children with financial relationships that may be relevant to the submitted work; and (4) DG is a member of the National Suicide Prevention Advisory Group (England) and supported the campaign to construct barriers on the Bloor Street Viaduct. MM has no non-financial interests that may be relevant to the submitted work.

Provenance and peer review: Commissioned; not externally peer reviewed.

- 1 Mann JJ, Apter A, Bertolote J, Beautrais A, Currier D, Haas A, et al. Suicide prevention strategies: a systematic review. *JAMA* 2005;294:2064-74.
- 2 Vyrostek SB, Annett JL, Ryan GW. Surveillance for fatal and nonfatal injuries—United States, 2001. *MMWR Surveill Summ* 2004;53:1-57.
- 3 Pirkis J, Blood RW. Suicide and the media. Part I: reportage in nonfictional media. *Crisis* 2001;22:146-54.
- 4 Gunnell D, Nowers M. Suicide by jumping. *Acta Psychiatr Scand* 1997;96:1-6.
- 5 Beautrais A. Suicide by jumping. *Crisis* 2007;28:58-63.
- 6 National Institute of Mental Health in England (NIMHE). Guidance on action to be taken at suicide hotspots. 2006. www.nmhdu.org.uk/silo/files/guidance-on-action-to-be-taken-at-suicide-hotspots.pdf.
- 7 Sinyor M, Levitt AJ. Effect of a barrier at Bloor Street Viaduct on suicide rates in Toronto: natural experiment. *BMJ* 2010;340:c2884.
- 8 Bennewith O, Nowers M, Gunnell D. The effect of the barriers on the Clifton suspension bridge, England on local patterns of suicide: implications for prevention. *Br J Psychiatry* 2007;190:266-7.
- 9 Harvard School of Public Health. National Violent Injury Statistics System (NVISS). www.hsph.harvard.edu/hicrc/nviss/index.htm.
- 10 Kreitman N. The coal gas story. United Kingdom suicide rates, 1960-71. *Br J Prev Soc Med* 1976;30:86-93.
- 11 Gunnell D, Fernando R, Hewagama M, Priyangika WDD, Konradsen F, Eddleston M. The impact of pesticide regulations on suicide in Sri Lanka. *Int J Epidemiol* 2007;36:1235-42.

12 Miller M, Hemenway D. Firearms and suicide in America. *N Engl J Med* 2008;359:672-3.

Cite this as: *BMJ* 2010;340:c3054