

Impact case study (REF3b)

Institution: University of Bristol
Unit of Assessment: UoA2
Title of case study: Fewer suicides worldwide following changes in policy and practice influenced by University of Bristol research
<p>1. Summary of the impact</p> <p>University of Bristol research has played an important role in shaping local, national and global suicide prevention initiatives. The consequent reductions in suicide rates have been substantial and many hundreds of lives have been saved thanks to this research.</p> <p>The scope and scale of the impact has ranged from shaping World Health Organisation (WHO) strategy on preventing suicides by pesticide poisoning, informing national legislation on limiting access to the means of suicide in several countries (e.g. analgesics in the UK – 1000 fewer suicides between 2008 and 2013), informing guidelines on the responsible reporting of suicide for the UK media, and developing highly successful prevention measures at the Clifton Suspension Bridge, a suicide site in Bristol (30 fewer suicides between 2008 and 2013).</p>
<p>2. Underpinning research</p> <p>Each year, suicide accounts for 5,000 deaths in the UK and one million deaths worldwide. In 1994 University of Bristol (UoB) researchers carried out the first systematic review of suicide prevention strategies [1]; they identified that restricting access to commonly used, highly lethal methods of suicide is one of the few effective approaches to suicide prevention strategies. This is because the risk of death varies enormously depending on the method used in a suicide attempt. Following an overdose of paracetamol and most antidepressants it is under 1%; after taking as little as a tablespoonful of the toxic weed-killer paraquat it is over 70%. The risk rises to over 95% in people who jump from high structures such as the Clifton Suspension Bridge in Bristol. Most people who survive a suicide attempt, even one using a high-lethality method, do not make a repeat attempt.</p> <p>The researchers' seminal review led to a series of studies, many led by the UoB, to clarify the factors that influence people's choice of suicide method [2], the key methods of suicide used in the UK and internationally [3,9], which methods were likely to respond to being restricted [4,5,9], and evidence of the effectiveness of such approaches [5,6,7].</p> <p>Research underpinning this impact included: (i) qualitative interviews (led by Biddle, Donovan and Gunnell, in collaboration with University of Taipei) with people who have survived high lethality suicide attempts in order to better understand their choice of suicide method [2,11]; (ii) evaluations (using natural experimental designs) of specific approaches aimed at reducing suicide by restricting access to methods such as pesticides and analgesics (UoB, Oxford and Edinburgh leads) [5-7,9,12]; (iii) systematic reviews [1,3,9] and (iv) collaboration with industry (Syngenta, the manufacturer of paraquat and other pesticides) to evaluate how a new formulation of paraquat affected death rates following self-poisoning with paraquat (Gunnell, epidemiology lead) [8].</p> <p>This research has been complemented by systematic reviews of the evidence concerning use of specific methods of suicide (pesticides, hanging, firearms, paracetamol and the painkiller co-proxamol) – how common they are, how preventable they are and death rates [3,9].</p> <p><u>Key findings of the research:</u></p> <ul style="list-style-type: none"> • Pesticide self-poisoning accounts for approximately one third of global suicides [3]. • Bans on toxic pesticides can have a profound impact on method-specific and overall suicide rates. A natural experimental evaluation of bans on toxic pesticides in Sri Lanka identified a halving of suicides following the bans [5]. • In-depth qualitative studies with survivors of near-lethal suicide methods in the UK and Taiwan reveal that news media reporting informed their choice of suicide method [2,11]. • Preventive barriers on the Clifton Suspension Bridge led to a halving of jumping suicides, with no substitution to other sites in Bristol [6,10]. • Bans on co-proxamol have resulted in a reduction in its use for suicide with no evidence of major substitution to other pain killers [7,12].

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Names of key University of Bristol researchers:

Professor David Gunnell (Professor of Epidemiology), University of Bristol, 1993-present.
 Professor Jenny Donovan (Professor of Social Medicine), University of Bristol 1990-present.
 Dr Lucy Biddle (Lecturer in Medical Sociology), University of Bristol 1999-present.
 Ms Olive Bennewith (Research Associate) University of Bristol 1998-2012.

3. References to the research

- [1] Gunnell D, Frankel S. Prevention of suicide: aspirations and evidence. *BMJ* 1994;308:1227-33. (Document can be supplied upon request)
- [2] Biddle L, Donovan J, et al. A qualitative study of factors influencing the decision to use hanging as a method of suicide. *BJPsych* 2010; 197, 320–325. DOI: 10.1192/bjp.bp.109.076349
- [3] Gunnell D, Eddleston M, Phillips M, et al The global burden of fatal pesticide self-poisoning: Systematic review. *BMC Public Health* 2007, 7:357. DOI:10.1186/1471-2458-7-357
- [4] Gunnell D, Hawton K, Murray V, et al. Use of paracetamol for suicide and non-fatal self-poisoning in the UK and France: are restrictions on availability justified? *JECH*. 1997;51:175-179 DOI: 10.1136/jech.51.2.175 (document can be supplied upon request)
- [5] Gunnell D, Fernando R, Hewagama M et al. The impact of pesticide regulations on suicide in Sri Lanka. *Int J Epid* 2007;36:1235-42. DOI: 10.1093/ije/dym164
- [6] Bennewith O, Nowers M, Gunnell D. The effect of the barriers on the Clifton Suspension Bridge, England on local patterns of suicide. *BJPsych* 2007;190:266-7 DOI: 10.1192/bjp.bp.106.027136
- [7] Hawton K, Bergen H, Simkin S, Wells C, Kapur N, Gunnell D. Six-Year Follow-Up of Impact of Co-proxamol Withdrawal in England and Wales on Prescribing and Deaths. *PLoS Med* 2012; 9: e1001213 DOI: 10.1371/journal.pmed.1001213
- [8] Wilks MF, Fernando R, Ariyananda PL, Eddleston M, Berry DJ, Tomeson JA, Buckley NA, Jayamanne S, Gunnell D, Dawson A. Improvement in survival after paraquat following introduction of a new formulation in Sri Lanka. *PloS Med*. 2008;5(2): e49. DOI: 10.1371/journal.pmed.0050049

Key Grants (all peer reviewed)

- [9] Gunnell (co-investigator) (2003-4) *Coroner Based Investigation of Suicide Methods*. Department of Health. £122,000
- [10] Gunnell (PI), Bennewith (co-investigator) (2005-6) *The effect of barriers on the Clifton Suspension Bridge, England on local patterns of suicide: implications for prevention*. American Foundation for Suicide Prevention \$45,000.
- [11] Gunnell (PI), Donovan, Biddle (co-investigators). (2006-9) *What influences the decision to use hanging as a means of suicide? A qualitative study of people who have survived a nearly lethal suicide attempt*. Department of Health £111,319.
- [12] Gunnell (PI), Donovan (co-investigator) (2007-11) *A multi-centre programme of clinical and public health research in support of the National Suicide Prevention Strategy for England*. Department of Health (NIHR) £1,012,247.

4. Details of the impact

UoB research findings have influenced local, national and international policymakers and health organisations, including the WHO, and have resulted in the implementation of public health measures to restrict access to specific suicide methods, as well as in curtailing news reporting of these methods. Implementation of these approaches has resulted in significant reductions in suicides.

Local research and its wider impact

UoB research led to the construction of effective barriers on the Clifton Suspension Bridge, Bristol. Evaluation of the impact of these barriers on suicide in Bristol indicates that they have prevented over 60 suicides by jumping (1998-2012): deaths from the bridge declined from eight per year (1994-98) to four per year (1998-2003) [6], with further reductions to three per year in (2008-11). An estimated 30 fewer suicides occurred in 2008-13 as a result of the barriers [a]. This research has been used to inform the planned introduction of prevention barriers at the Golden Gate Bridge, USA (a process that has included consultation with Gunnell in 2006 during the planning of the barriers), and at other sites [b,c]. The Department of Health (England) used the research findings in their Impact assessment of the National Suicide Prevention Strategy [d]. The Bristol research on

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preventing suicides by jumping has also been used to inform position statements from important NGOs on this issue, e.g. the National Suicide Prevention Lifeline (USA) statement on preventing suicide from bridges.

Paracetamol and Co-proxamol in the UK

The pain killers paracetamol and co-proxamol accounted for almost half of all the UK's overdose suicide deaths in the 1990s. UoB work on method restriction [1] and the relationship between paracetamol availability, pack size and mortality following paracetamol overdose [4] has contributed to policies to restrict paracetamol pack size. Subsequent evaluative research (with Oxford (lead) and Manchester) showed that restrictions in the UK led to reductions in paracetamol deaths and liver transplantation (estimated 765 fewer deaths in 1999-2009; this equated to 400 fewer in 2008-13[e]). Similarly, UoB's collaborative work with Oxford (lead) and Manchester on the impact of co-proxamol withdrawal [7] demonstrated that there have been 600 fewer co-proxamol suicides since its withdrawal (2005-10).

Impact on countries' national policies

UoB research has materially influenced recommendations in national policy documents. For example: The 2012 National Suicide Prevention Strategy for England *Preventing Suicide in England: a cross-government outcomes strategy to save lives* includes citations concerning prevention of suicide by hanging and bridge jumping [f]; Ireland's 2000 Strategy *Reach Out* (hanging), the 2012 USA *National Strategy for Suicide Prevention* (pesticide poisoning) [g]; and the Canadian Institute of Health Economics report *Means Restriction for Suicide Prevention* (pesticides, paracetamol and coproxamol).

Global impact

UoB-led research on pesticide poisoning has been used widely by the WHO to inform priorities for prevention in both global and regional (Western Pacific) suicide prevention documents [h,i]. The research, including that carried out in collaboration with colleagues in the South Asian Clinical Toxicology Research Collaboration (SACTRC), encouraged the WHO to respond to the global problem of pesticide suicides. Gunnell was a member of the WHO advisory group and wrote an editorial to disseminate the work jointly with the WHO leads for the strategy. Since the publication of these documents, the Registrar of Pesticides in Sri Lanka has banned paraquat, one of the most toxic pesticides ingested by humans; and China, where pesticides account for two thirds of all suicides in rural areas, has banned over 20 highly toxic pesticides (see: <http://www.reach24h.com/en/news-a-events/item/439-production-ban-on-22-highly-toxic-pesticides.html>). Bans have also been introduced in Korea, Europe and India. Bristol researchers' evaluation of bans on the most toxic pesticides in Sri Lanka indicated that they resulted in 19,769 fewer suicides in 1996–2005 as compared with 1986–95 [2]. Based on these estimates, recent bans will have resulted in many thousands of fewer suicides globally, as there are an estimated 370,000 pesticide suicides worldwide every year [3]. UoB researchers worked with the company Syngenta to evaluate the impact of an improved formulation of paraquat on case-fatality. It was shown that such new formulations failed to substantially reduce case-fatality and imports of paraquat were subsequently restricted in Sri Lanka [8].

Working with the mass media

UoB's work on suicide has informed the revised media guidelines produced by the Samaritans (2013) and was used in briefings given to major national news and media organisations (including ITV and the BBC). Gunnell met with national newspaper editors in Parliament (organised by Madeleine Moon MP, 30 Jun 2009), the Press Complaints Commission (London, 20 Jan 2011), the Evening Post (Bristol, 21 Dec 2011) and BBC, S4C and ITV and other news agencies in Wales (Cardiff, 4 Dec 2012) to discuss their reporting of suicide methods and to urge caution in describing suicide methods, particularly those that are novel, highly lethal and readily accessible such as those that have led to rises in suicide in some countries in East Asia. The Samaritans used our research on the impact of their proactive approach to advise the press on how to report (and when not to report) novel methods of suicide in their submission to the Leveson Inquiry [j]

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Additional benefits to society, the economy, and the police and health services

It is estimated that for every suicide, six people are seriously affected, so the overall fall in suicide rates reduces the emotional toll on friends and family, who may require bereavement and counseling services and time off work due to the bereavement (which also carries a cost to the economy). The reduced toxicity of drugs / poisons taken in overdose will also result in cost savings through reduced use of intensive care beds and shortened hospital admissions. These are real and substantial benefits but the actual cost saving is difficult to quantify.

5. Sources to corroborate the impact

- [a] Sources to corroborate impact of research on suicide by jumping / suicide from the Clifton Suspension Bridge: Data from Mr Dave Anderson, Bridgemaister, Clifton Suspension Bridge Suicide showing reduction in suicide; [reference [6], page 2 includes data on deaths before the installation of the barrier].
- [b] The use of barriers on the Clifton Suspension Bridge has used to inform construction of a bridge barrier for the Archway Bridge, London (email seeking advice)
- [c] The use of barriers on the Clifton Suspension Bridge has used to inform construction of a bridge barrier for the Archway Bridge: online news article citing suspension bridge barrier halving suicides): <http://hollowayexpress.co.uk/large-anti-suicide-barriers-to-be-installed-at-archway-bridge>
- [d] Source to corroborate use of research on suicide by jumping on national strategy Impact assessment - used in UK Government Impact Assessment / Consultation on New Government Suicide Prevention Strategy 2011 <http://www.thecalmzone.net/wp-content/uploads/2013/05/government-suicide-strategy-impact-assessment.pdf> (page 2);
- [e] Evidence of the impact of co-proxamol and paracetamol restrictions on reducing suicides. Reference [7] and Hawton et al Long term effect of reduced pack sizes of paracetamol on poisoning deaths and liver transplant activity in England and Wales: interrupted time series analyses *BMJ*2013;346:f403 doi: 10.1136/bmj.f403
- [f] Examples of impact of work on National Suicide Prevention Strategy for England: National Suicide Prevention Strategy for England (DoH 2012): Preventing Suicide in England: a cross-government outcomes strategy to save lives (DoH, 2012) <http://www.dh.gov.uk/health/files/2012/09/Preventing-Suicide-in-England-A-cross-government-outcomes-strategy-to-save-lives.pdf>. (UoB research cited on pages 54-56)
- [g] Evidence of reach of research into other country's national prevention strategies: Research cited to support method restriction on page 44 of the 2012 National Strategy for Suicide Prevention document (USA): http://www.surgeongeneral.gov/library/reports/national-strategy-suicide-prevention/full_report-rev.pdf;
- [h] Evidence of reach of research into WHO strategies to prevent suicide, particularly pesticide suicide – research findings cited in *Violence prevention, the evidence: Guns, knives and pesticides: reducing access to lethal means WHO 2009 ISBN 978 92 4 159773 9* (see pages 63, 71 and 72 references: 6,94,111);
- [i] Towards Evidence Based Suicide Prevention Programmes WHO Western Pacific Region: WHO, 2010 ISBN 978 92 9061 462 3 (see pages 9,12,14,17);
- [j] Evidence of impact of research on media reporting of suicide methods: Research on novel methods of suicide cites Samaritans evidence to the Leveson Inquiry: <http://www.levesoninquiry.org.uk/witness/samaritans/>.
- [k] Further evidence of impact of research on media reporting of suicide methods: Letter from The Samaritans summarising the contribution made in relation to working with the media to improve reporting of suicide.