Institution: King's College London		
Unit of Assessment: 19 Politics and International Studies		
Title of case study: Incorporating behavioural science into policy making, planning and response for emergencies.		
Period when the underpinning research was undertaken: 2004 - 2019		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
Professor Brooke Rogers	Professor of Behavioural Science & Security	From 2004
Dr Julia Pearce	Senior Lecturer	From 2009
Period when the claimed impact occurred: Aug 2014 – Dec 2020		
Is this case study continued from a case study submitted in 2014? N		

1. Summary of the impact

King's research has demonstrated that the public are largely resilient to extreme events (e.g., terrorism, pandemics, flooding) and highlighted the role of effective communication in informing protective health behaviours before, during, and after civil emergencies of this kind. This work demonstrates that many policies, plans, and responses for emergencies are based on inaccurate assumptions about public risk perceptions and behaviours. This can lead to situations where public behaviours overwhelm emergency response systems. Rogers and Pearce have worked with industry, emergency response, local, national, and international government organisations to enhance their ability to influence public responses to extreme events; address concerns about causing public panic when communicating; and reframe the representation of the public in emergency response processes. This has allowed King's research to have a significant impact on policy making, planning and response for emergencies. Specifically, it has (i) changed the ways that public responses are incorporated in UK national risk assessments, (ii) repositioned behavioural science at the heart of emergency response policy, and (iii) informed security-focused communication with the public and industry.

2. Underpinning research

Emergency policies and plans are often based on inaccurate assumptions about public responses to extreme events. This precludes attempts to engage with members of the public, leading to suboptimal emergency response and health outcomes. King's research has demonstrated that the public are largely resilient to extreme events; challenged the long-held misconception of the panic-prone public; provided evidence supporting a range of behavioural responses; and demonstrated the importance of public communication to inform protective health behaviours before, during, and after extreme events. This research has spanned seven collaborative projects designed to test and advance theories of risk perception, risk communication and behaviour to understand and inform public psychological and behavioural responses to extreme events such as terrorism and pandemics.

This body of research has not only extended theories of risk perception, risk communication, health and social psychology [1-6], but has improved knowledge and understanding about public responses to low likelihood, high impact events (including chemical, biological, radiological or nuclear (CBRN) terrorism [1-3]; marauding terrorist firearms attacks [4], and major power outages [6]). In so doing, it has helped to identify the perceived risk and information needs before, during and after a range of low likelihood high impact events [1-6], developed and tested evidence-based and theoretically driven risk communication interventions [1-5] and established the extent to which interventions developed in the UK need adaptation for use in other national contexts and for different target population groups [1-6].

Specifically, King's research has established that pre-event communications designed to encourage the public to undertake protective health behaviours during a terrorist attack (e.g. Run, Hide, Tell) are unlikely to increase the perceived risk from terrorism but can increase trust and confidence in the government and security services' ability to provide guidance that can keep the public safe [1-4]. This research has also identified the importance of not only communicating what actions should be taken, but also advising the public about behaviours that should be avoided [1-4]. Additionally, it has established that while the impact of guidance reduces over time, those who have viewed it continue to be more likely to adopt protective health behaviours than those who have received no guidance [4]. Finally, King's researchers have established that general principles of risk communication hold true across a range of events and national contexts, but that guidance should be adapted to consider differing levels of trust in responding organisations [1-6].

3. References to the research

[1] Rogers, M. B., Amlôt, R., & Rubin, J. (2013) The impact of communication materials on public responses to a radiological dispersal device (RDD) attack. *Biosecurity and Bioterrorism-Biodefense Strategy Practice and Science*, 11(1), 49-58. DOI:10.1089/bsp.2012.0059

[2] Pearce, J.M., Rubin, G.J., Amlôt, R., Wessely, S. and Rogers, M.B. (2013) Communicating public health advice following a chemical spill: Results from national surveys in the UK and Poland. *Disaster Medicine and Public Health Preparedness*, 7(1), 65-74. DOI:10.1001/dmp.2012.56

[3] Pearce, J.M., Rubin, G.J., Selke, P., Amlôt, R., Mowbray, F. and Rogers, M.B. (2013) Communicating with the public following radiological terrorism: Results from a series of focus groups and national surveys in Britain and Germany. *Prehospital and Disaster Medicine*, 28(2), 1-10. DOI:10.1017/S1049023X12001756

[4] Pearce, J.M., Parker, D., Lindekilde, L. and Rogers, M.B. (2019) Communicating with the public about marauding terrorist firearms attacks: Results from a survey experiment on factors influencing intention to 'Run Hide Tell'. *Risk Analysis*. Published online: 20 Mar 2019. DOI:10.1111/risa.13301

[5] Pearce, J.M., Lindekilde, L., Parker, D., Bouhana, N. and Rogers, M.B. (2019) Encouraging public reporting of suspicious behaviour on rail networks. *Policing and Society*. Published online: 19 April 2019. DOI:10.1080/10439463.2019.1607340

[6] Rubin, G.J. and Rogers, M.B. (2019) Behavioural and Psychological Responses of the Public During a Major Power Outage: A Literature Review. *International Journal of Disaster Risk Reduction, 38.* DOI:10.1016/j.ijdrr.2019.101226

4. Details of the impact

King's research has had a significant impact on policy making, planning and response for emergencies by (i) changing the ways that public responses are incorporated in UK national risk assessments, (ii) repositioning behavioural science at the heart of emergency policy, planning, and response processes and (iii) informing and changing security-focused communication with the public. Based on their collective body of research [1-6], Rogers and Pearce have worked closely with a range of key stakeholders to enhance the ability of these organisations to influence public responses to extreme events; address practitioner concerns about causing public panic when communicating; and change the ways in which members of the public are considered and framed in planning and response. Professor Rogers received an OBE in the 2018 New Years' Honours List for 'services to academia and government' in recognition of her success in translating King's research into evidence-based policy and practice for the emergency services, industry and local, national and international government organisations.

The impact of King's research is a direct result of the extensive engagement Rogers and Pearce have undertaken through project work and advisory roles. Engaging as independent experts, drawing on their collective body of research, they feed principles of effective risk communication into large-scale cross government initiatives. They also provide briefings on specific project findings [e.g. 4,5] that inform new initiatives such as the Action Counters Terror (ACT) campaign,

and assess the effectiveness of existing communication (e.g. See it, Say it, Sorted; Run, Hide, Tell) to support the development of improved messages. As a result of these extensive engagement activities specific impacts can be seen in:

i: Changing National Risk Assessment methods and communication

[text removed for publication] King's research has improved UK government's understanding of the behavioural impacts of civil contingencies risks through Rogers' and Pearce's contributions to the Cabinet Office National Risk Assessment (NRA) and the National Security Risk Assessment (NSRA). The NRA and NRSA are classified cross-government processes undertaken to identify, characterise, and compare the most significant national security hazards and threats. These assessments enable local and national government and emergency services to prepare for major emergencies. In June 2013, Rogers was asked to form/Chair the NRA Behavioural Science Expert Group (BSEG). BSEG was the first academic advisory board established to provide independent, evidence-based advice for the NRA process. BSEG's success in improving psychological measures set an example for other expert groups [A].

As members of BSEG Rogers and Pearce (Deputy Chair) have advised on risk scoring for all subsequent NRAs and NSRAs. This included recommending improvements to the processes that led to the commissioning of five confidential reports, all of which were co-authored by Rogers and Pearce. As a result, the scales used to measure the psychological impact of risk scenarios were changed, as was the framing of public disorder in events [A]. This in turn informed the development of a new National Resilience Planning Assumption (NRPA) on psychological responses co-drafted by Pearce. NRPAs are used to identify the common consequences of NRA/NRSA risk scenarios which directly support local risk planning. [text removed for publication]

Additionally, King's research informed the inclusion of guidance in the National Risk Register (NRR) (the public facing version of the NRA/NSRA) on what the public can do in response to these risks for the first time in 2017 [B1]. This guidance was further refined by Rogers and Pearce for the 2020 edition [B2]. This transformed the NRR from a public-facing document written primarily for practitioners into a publicly relevant document to better enable management of personal risks.

As a consequence of their contribution to the NRA, Rogers and Pearce were invited by Scottish Government's Resilience Division (SGRD) in 2016 to support the development of the Scottish Risk Assessment (SRA), a contribution which has been described as "*instrumental in shaping the document we use today"* [C]. Rogers and Pearce continue to provide input into the SRA and training for the SGRD team and risk author colleagues. This training has "*significantly improved their* [the risk authors'] *understanding of how to effectively assess the accuracy of psychological impact factors* [...] *and empowered us* [SRGD] *with the skills to effectively challenge our risk authors, resulting in more stringent assessment of risk"* [C].

ii: Reshaping and repositioning the role of behavioural science contributions to policy, planning, and response processes for disasters and extreme events.

Rogers and Pearce's collective body of work [1-6] and ongoing engagement with local, national and international policy makers, emergency responders, and publics has reframed policy and practitioner understandings of public responses to disasters and extreme events and formally repositioned behavioural science at the heart of emergency policy, planning, and response processes. This is evidenced by appointments to longer-term, high-level leadership and strategic roles (e.g. BSEG, Home Office Science Advisory Council (HOSAC), The Prime Minister's Council for Science and Technology (CST)), as well as significant contributions to fast-paced emergency events such as threats to aviation security and the COVID-19 pandemic.

Rogers contributed to two Blackett Reviews, a government process in which small expert panels provide critical advice on scientific time-sensitive questions primarily in the security domain. Notably, she was the only behavioural scientist involved in the 2017 Blackett Review where she "*identified a key and distinct role for behavioural and human sciences in Aviation Security (AvSEC)"* [D]. Consequently, a full chapter on behavioural sciences was included in the review, rather than the few lines intended for this topic [D]. The report was delivered directly to the Prime Minister and the National Security Council and this "*...led in part to Department for Transport increasing capability in AvSec and developing a new strategy to deal with highly sophisticated concealed explosives"* [D]. Rogers also co-authored a 2018 Cabinet Office commissioned review

of evidence on public responses to major power outages [4] [E]. These findings "*on the value of early and consistent communication with the public in the wake of a power outage have been especially valuable and have been directly incorporated into a post-incident national communications strategy which was tested by Ministers in a table-top exercise*" [E].

Prior to COVID-19, Rogers used King's research [1-6] to shape government exercises and workshops, including using evidence to inform public facing information, calling for public communication when it was not taking place, and feeding evidence into conversations about critical national infrastructure performance during emergencies [D,E,F]. This "*contributed to improved understanding and use of behavioural sciences during response to emergencies, leading to the Standard Operating Procedure for SAGE to require attendance of behavioural scientists during emergency responses*" [D]. Consequently, Rogers was invited to contribute to the Scientific Advisory Group for Emergencies (SAGE) in 2014. SAGE is chaired by the Government's Chief Scientific Adviser to provide direct advice to central government during an emergency. In 2020 Rogers attended SAGE as an independent academic during the COVID-19 pandemic. She co-chaired the behavioural science sub-group (SPI-B), chaired the SPI-B group on education (SPI-Kids), was theme leader for the Security & Policing subgroup during the response, and contributed to the Children's Task & Finish Group [G]. Rogers drew on King's research [1-5] to support the cross-governmental response to the pandemic, including informing behaviours to reduce transmission in the workplace [H], neighbourhood level release/local restrictions, public gatherings, and re-opening large events [F]. For example, "*Rogers' work on the wider impacts of and harms of school closures, as part of the SPI-B working group on children, has provided fundamental advice supporting the policy prioritisation of schools being the first to open and the last to close during COVID-19*" [G]. Additionally, Pearce contributed to a SAGE subgroup to provide science advice relating to the effects of COVID-19 on ethnic minority groups. This included co-authoring a report on impacts of targeted public health communications, which "*helped inform Covid-related government communication strategies aimed at ethnic minority groups"* [G]. To the end of December 2020, Rogers and Pearce's research [1,3,5 and more] has been cited in at least 20 SAGE reports to evidence and shape advice about public responses to COVID-19 related challenges (e.g. adherence and acceptability).

iii: Informing and changing security-focused communication with the public and industry

King's research [1-6] directly informs security-focused communication practices and campaigns in the UK through Rogers' and Pearce's long-standing engagements with organisations such as the Home Office and the Centre for the Protection of National Infrastructure (CPNI). It also informs international policy and practice, for example through Rogers' engagement with OECD, and the US National Academies of Sciences, Engineering, and Medicine, and via Pearce's engagement with the UN Department of Safety and Security, NCTV (the Dutch security services) and the Swedish police.

Internationally, King's research [5] has been used "*to initiate and shape* [NCTV's] *online risk communications campaign about 'Run, Hide, Tell' in the Dutch way*" [I]. This research also features as a case study in the Counter Terrorism Preparedness Network (CTPN) Community Preparedness report, which is being used to inform city-level counter-terrorism policies and practices across six major European cities [J].

The Home Office benefits from Rogers' and Pearce's ongoing contributions through academic project briefings (e.g. Run, Hide, Tell; See It, Say It, Sorted), rapid responses to emergencies (e.g. COVID-19), and through Rogers' leadership of the Home Office Science Advisory Council (HOSAC) since April 2019. Additionally, King's research into public attitudes and communication needs related to public security incidents [1-5] led the Home Office to "*reconsider the ways in which public bodies can communicate about these issues to members of the public*" by identifying "*challenges that needed to be overcome" and "opportunities for communications to aid the public's understanding and capability around security in public spaces"* [F]. Through HOSAC, King's research [1-5] has also been incorporated into guiding principles for Chemical, Biological, Radiological and Nuclear (CBRN) risk communication. This guidance "*has been shared across Government and has informed and influenced policy decisions relating to future communication campaigns"* [F] and now forms the basis for all public communication campaign about CBRN incidents. Rogers' SAGE SPI-B Policing and Security sub-group reports into local lockdowns,

public gatherings, and re-opening large events [1-2,4 and others] "*have supported the Home Office response, and the UK Government's response to COVID-19 as a whole"* [F].

Additionally, Rogers and Pearce used King's research [1-5] to inform the development and assessment of cross-government, security-based interventions (Action Counters Terrorism (ACT)) via engagement with the UK Centre for the Protection of National Infrastructure (CPNI). CPNI highlighted *"Of particular note here was your expert input to our baseline and evaluation questionnaire survey designs to help us achieve balance of measuring effect whilst continuing to further our fundamental understanding of barriers and facilitators of reporting in the public"* [H]. CPNI went on to commission Rogers and Pearce to work on the testing and development of the 'See it, Say it, Sorted' campaign, based on King's research [5] which "*addressed an academic and an operational gap in understanding",* CPNI also funded a one-year follow up study of King's research [4] to examine the longer-term impacts of the 'Run, Hide, Tell' campaign [H].

Finally, Rogers co-authored a CPNI/SPI-B SAGE report designed to inform behaviours to reduce transmission in the workplace to enable Critical National Infrastructure (CNI) organisations to continue to function securely during COVID-19. This work "*provided evidence for and emphasised the importance of co-creation and a sense of shared responsibility in developing and maintaining COVID-secure workplaces*" [H]. It was part of a larger CPNI workplace behaviour campaign designed to help organisations manage security risks throughout COVID-19 "*which in itself drew upon the KCL insights* [5] *generated by the CPNI funded project on See It, Say It, Sorted (indeed all previous work with KCL)"* to generate "*the most engaged with and downloaded campaign on our CPNI website in 2020*" (receiving over 14,000 unique views and similar levels of downloads between March and May 2020) [H].

5. Sources to corroborate the impact

[A] Testimonial from UK Government, Cabinet Office confirming BSEG contributions

[B] UK National Risk Register of Civil Emergencies 2017 and 2020 Editions

[C] Testimonial from Scottish Government confirming SRA contributions

[D] Testimonial from Go-Science confirming AVSEC and pre-COVID-19 SAGE impacts

[E] Testimonial from UK Government, Cabinet Office confirming impact of power outages work.

[F] Testimonial from UK Government, Home Office

[G] Testimonial from UK Government Chief Scientific Advisor confirming contributions to UK COVID-19 response.

[H] Testimonial from UK Centre for the Protection of National Infrastructure

[I] Testimonial from National Coordinator for Security and Counterterrorism (Dutch security services)

[J] Counter Terrorism Preparedness Network Community Preparedness Report 2019