Title: Protocol for randomised double-blind controlled trial of the effect of responder communication on willingness to adhere to initial decontamination protocols in a virtual chemical incident

Background

Based on the systematic review reported in Chapter 2 and the crisis communication overview reported in Chapter 3, message acceptance and resulting adoption of target protective behaviours in an emergency are facilitated by the provision of key items of information. Fundamentally, casualties need to know: what the emergency is (1-6); what protective actions they need to take (6-13); and what actions are being taken by authorities to resolve the situation (9, 10, 14). Participants interviewed in the study reported in Chapter 6 voluntarily raised these details as expected information requirements.

The peripheral factor of trust in the communicator or message source as a facilitator of compliance with emergency directives (8, 11, 15-21), can be improved by highlighting the competence and expertise of the communicator (22, 23). Results from the lay public interviews reported in Chapter 6 indicated that trust in first responders who communicate instructions would be improved by making salient the responders' authority on the subject of decontamination, for example by stating that they are trained to respond to chemical incidents.

A messaging framework consisting of a statement about the credentials of the message source followed by information about the incident and instructions on what protective actions to take is still open to interpretation on the part of the end users in the emergency services. There is more than one approach to framing information about the incident to casualties. In the investigation into current communication practice reported in Chapter 4, example messages emerged from the guidance documents and interviews with first responders that described the nature of the incident whilst understating the threat posed by a hazardous chemical, such as "It is highly unlikely that any harm has come to you". Conversely, there were also messages that unequivocally described the threat posed to casualties, such as "as far as we're concerned you're all contaminated". The justification raised by interviewees for understating the threat was to reassure casualties. But unsubstantiated reassurance during crisis communication is a barrier to trust in the messenger (3, 7, 11, 15, 21, 24).

There is a strong theoretical rationale, based on Protection Motivation Theory (PMT) (25, 26) and the Extended Parallel Processing Model (EPPM) (27, 28), for framing information about the incident in a way that makes salient the severity of chemical contamination and the likelihood that members of the message audience have been contaminated in order to improve the likelihood of message acceptance and target behaviour change. Specifically in the EPPM, a level of fear is required as part of the message acceptance process. The framing of information to be threatening would only be conducive to message acceptance and target behaviour change when followed by information about the efficacy of protective actions at reducing or preventing the threat, based on PMT and the EPPM. In the absence of perceived response efficacy, message recipients engage in a process of fear control whereby they attempt to protect themselves from the fear of the threat rather than the danger posed by the threat (29). The direction of processes in the EPPM is such that the message audience is unlikely to assess the efficacy of target behaviours unless they have first assessed the threat as high. Information about the efficacy of protective action is currently used in practice, based on interviews with first responders and the review of guidance documents in Chapter 4, for example, "the best thing you can do is to release that

outer layer and wipe away from your face and stuff; and that's scientifically what's the best for you" though there is no evidence for the prevalence among responders of addressing response efficacy when communicating with casualties.

Meta-analyses have indicated that the most effective fear appeals are high in both threat and efficacy information (29, 30). The parameters of a chemical incident, in which the message to take action must be accepted and acted on within a particularly narrow timeframe are a departure from the studies included in these meta-analyses in which target behaviour change or intended behaviour change was assessed for health behaviours that occurred over longer timeframes.

Aims and objectives

The primary research question that this study aims to address is whether the manipulation of information about the threat of chemical contamination and efficacy of decontamination affect willingness to adhere to initial decontamination protocols.

H 1. Messages in which the threat of chemical contamination is understated by the communicator (Low Threat) will result in lower expected adherence to the initial decontamination protocol than messages in which the threat is emphasised (High Threat) or there is no attempt to emphasise or understate the threat beyond stating that there is a suspected chemical release (Neutral Threat).

H 2. There will be no difference between Low Threat, High Threat, and Neutral Threat messages on expected engagement in alternative courses of action (going to hospital, leaving the area, and seeking further information).

H 3. Messages in which the communicator emphasises the efficacy of initial decontamination actions at reducing the threat of chemical contamination will result in higher expected adherence to the initial decontamination protocol than messages in which the efficacy of initial decontamination is not addressed.

H 4. Messages in which the communicator emphasises the efficacy of initial decontamination actions at reducing the threat of chemical contamination will result in lower expected engagement in alternative courses of action (going to hospital, leaving the area, and seeking further information) than messages in which the efficacy of initial decontamination is not addressed.

H 5. High Threat and Neutral Threat messages in which the communicator emphasises the efficacy of initial decontamination actions at reducing the threat of chemical contamination will result in higher expected adherence to the initial decontamination protocol than High Threat and Neutral Threat messages in which the efficacy of initial decontamination is not addressed.

H 6. High Threat and Neutral Threat messages in which the communicator emphasises the efficacy of initial decontamination actions at reducing the threat of chemical contamination will result in lower expected engagement in alternative courses of action (going to hospital, leaving the area, and seeking further information) than High Threat and Neutral Threat messages in which the efficacy of initial decontamination is not addressed.

H 7. There will be no difference between a Low Threat message in which the communicator emphasises the efficacy of initial decontamination actions at reducing the threat of chemical contamination and a Low Threat message in which the efficacy of initial decontamination is not addressed on either expected adherence to the initial decontamination protocol or expected engagement in alternative courses of action.

The hypotheses pertaining to secondary objectives of the investigation are as follows.

H 8. Messages in which the threat of chemical contamination is understated by the communicator (Low Threat) will result in lower perceptions of anxiety than messages in which the threat is emphasised (High Threat) or there is no attempt to emphasise or understate the threat beyond stating that there is a suspected chemical release (Neutral Threat).

H 9. Messages in which the threat of chemical contamination is understated by the communicator (Low Threat) will result in lower perceptions of threat severity than messages in which the threat is emphasised (High Threat) or there is no attempt to emphasise or understate the threat beyond stating that there is a suspected chemical release (Neutral Threat).

H 10. Messages in which the threat of chemical contamination is understated by the communicator (Low Threat) will result in lower perceptions of threat susceptibility than messages in which the threat is emphasised (High Threat) or there is no attempt to emphasise or understate the threat beyond stating that there is a suspected chemical release (Neutral Threat).

H 11. Messages in which the communicator emphasises the efficacy of initial decontamination actions at reducing the threat of chemical contamination will result in higher perceptions of the response efficacy of the initial decontamination protocol than messages in which the efficacy of initial decontamination is not addressed.

H 12. Messages in which the threat of chemical contamination is understated by the communicator (Low Threat) will result in lower perceptions of trust in the communicator than messages in which the threat is emphasised (High Threat) or there is no attempt to emphasise or understate the threat beyond stating that there is a suspected chemical release (Neutral Threat).

H 13. Messages in which the communicator emphasises the efficacy of initial decontamination actions at reducing the threat of chemical contamination will result in higher perceptions of trust in the communicator than messages in which the efficacy of initial decontamination is not addressed.

H 14. There will be no effect of communication intervention on perceptions of response costs associated with undergoing initial decontamination or perceptions of self-efficacy in adhering to the initial decontamination protocol.

H 15. Perceived trust in the communicator will affect expected adherence to the initial decontamination protocol after taking perceived threat severity, threat susceptibility, anxiety, response efficacy, response costs and self-efficacy into account.

Design

A double-blind randomised controlled trial with a 3x2 independent measures design will be used to assess the effects of threat and efficacy message constructs in a communication intervention delivered by a first responder via voice amplification on participants' self-report expectation of their willingness to adhere to preliminary self-protective behaviours during a simulated chemical incident.

Messaging frameworks recorded as audio interventions to simulate a first responder communicating via voice amplification technology will be administered to participants in an immersive environment presented via a virtual reality headset. In the video presented to participants, symptoms of chemical exposure will be non-salient to replicate the delayed onset of symptoms following exposure to chemical agents, such as sulphur mustard.

IV1: Threat	**IV2: Efficacy**	
	Efficacy Message items pertaining to casualties' self-efficacy and efficacy of instructed behaviours at reducing threat	No Efficacy (Control) No message items pertaining to casualties' self-efficacy and efficacy of instructed behaviours at reducing threat
High-Threat Message items designed to increase perceptions of severity and susceptibility	*Condition 1*	*Condition 2*
Low-Threat Message items designed to decrease perceptions of severity and susceptibility	*Condition 3*	*Condition 4*
Neutral-Threat (Control) Message items designed to inform casualties about the threat without overtly increasing or decreasing perceptions of severity and susceptibility	*Condition 5*	*Condition 6*

Participants

The effect size used in the power analysis to determine sample size requirement was informed by a meta-analysis effect size of studies that tested the effect of combined high threat and high efficacy information on true behavioural outcomes , d = 0.71 (31), which equates to f = 0.3550. Other meta-analyses of studies that included attitude and/or behavioural intention as outcome measures, which are more proximal to the measures used in the present study, found meta effect sizes, η^2= 0.21 (29) and d=0.98, (32), which, if entered into the power analysis, would have yielded a required sample size of 63 or 68 respectively.. A decision was made to use the lower effect size based on true behavioural outcomes, f= 0.35 (31), as a conservative estimate.

G*Power 3.1.9.2 (Franz Faul, Universität Kiel) was used to compute required sample size for ANOVA fixed effects, special, main effects, and interactions using *a priori* power analysis. The number of groups, numerator df, alpha, power and effect size (f) were set at 6, 2, 0.05, 0.95, and 0.35 respectively. The computed required sample size was 130 (

Appendix A), which was rounded up to **132** to allow for an equal number of participants across groups (22 per group).

Participants are eligible for participation if they are 18 years of age or older, are fluent in written and spoken English, and do not have visual or hearing impairments. Participants will be excluded if they have any professional experience or expertise in emergency response or toxicology.

Based on consultation with a Public Involvement panel, it was decided that university students are not necessarily representative of the wider UK population and so measures should be taken to ensure that participants are not recruited exclusively from student populations. However, recruitment of students fulfils the homogenous sampling criterion that differentiates a controlled efficacy study from a less controlled but more ecologically valid effectiveness study (33).

Participants will be reimbursed with £30 for their time.

Materials

Communication interventions

One of the aims of the qualitative investigation into the standard practice of first responders' communication with casualties of chemical incidents was to identify available communication channels for disseminating information to casualties. The use of voice amplification, whether through shouting or using technologies such as handheld loudhailers or vehicle-mounted public address systems, emerged as an available means of transmitting information to casualties. Alternative communication channels identified via this study were either not conducive to the relaying of comprehensive information, for example physical demonstration of actions to be taken performed by responders, or were not open to adaptation during the incident, for example pre-recorded messages or signage. Therefore, in the present study, the effectiveness of message components will be tested using the communication channel of amplified voice.

The process used to draft the messaging framework in each condition is outlined in the preceding chapter. The text of the communication intervention in each condition, as displayed in Appendix B, were recorded using professional audio recording equipment and the same voice artist for all conditions to ensure that accent and fundamental frequency are consistent. Steps were taken to ensure that volume and pitch are consistent. Sound effects were used to simulate the use of voice amplification technology, such as a loudhailer. Statements that were present in more than one condition were duplicated in order to minimise acoustic variability in delivery of messages.

Immersive video

The video, recorded from the vantage point of the person viewing the video, was recorded using a 360 camera. The video consists of students (n = 14) in a lecture hall hearing a fire alarm and proceeding to file out of the room to a muster point. At the point in the immersive video when casualties would be required to undergo IOR decontamination, the video will stop and the participants will complete behavioural measures outlined in the next section. The video is presented to participants via a mobile virtual reality headset (Oculus VR, LLC).

Measures

All outcome measures were assessed by a Public Involvement panel and by colleagues of the researcher who have minimum Master's degree psychology qualifications. They were asked to discuss whether or not the questions enabled them to convey their expectations as to how they would feel and behave and whether or not the wording of questions was confusing.

All measures, aside from demographic characteristic measures will be Likert scales and will be recorded using the online survey tool, Qualtrics. Measures will be recorded immediately after the immersive video ends and the headset is removed. Participants will be informed that the measures apply to how they would feel at the point in the scenario when the communication intervention concludes.

All measures are presented in Appendix C.

Primary outcome measures: Behavioural expectation

Consistent with self-report scale measures used in previous studies on expected behaviour in a disaster situation (6, 9, 10, 13, 34), participants will be asked to indicate their hypothetical likelihood of engaging in selected behaviours. Given that participants will be asked to rate the likelihood of behaviour during a hypothetical scenario, behavioural *expectation* is a more appropriate measure than *intention*. Intention implies a plan to engage in a particular course of action, whereas expectation denotes the perceived likelihood that a course of action will be taken (35). Behavioural expectation will be measured with three items for each behaviour that correspond to wanting, trying, and intending to engage in the behaviour. The wording of each item was informed by Teasdale et al. (36), in a study on intended behaviours during a hypothetical pandemic flu outbreak. In the present study, participants will be asked to rate the extent to which they would be likely to *want*, *try*, or *do* each behaviour. The purpose of including the "want to" and "try to" items is to account for the role of perceived behavioural control (37) in the participant's decision-making process when considering each action. Given that a proportion of behavioural expectations will pertain to actions instructed by the first responder in the scenario, the inclusion of "wanting" and "trying" will mitigate against the risk that participants expect to adhere to the IOR protocol as a function of compliance rather than volition.

Behaviours are categorised according to whether they are indicative of the predicted latent variable of adherence and message acceptance or non-adherence and message rejection.

Adherence and message acceptance

Adherence will be measured with three items (intending, wanting, and trying) for three different behaviours which correspond to the main components of the IOR protocol. The three behaviours are: remaining in place for the arrival of a decontamination shower; disrobing; and dry decontamination. All three behaviours are actions that were instructed to casualties by the first responder during the scenario.

Non-adherence and message rejection

Behaviours pertaining to the latent variable of non-adherence were informed by the outcomes of the mental models interviews reported in Chapter 6, in which participants volunteered actions that they would consider taking in the absence of adequate information from authorities. The actions are: going straight to a hospital without following any of the police officer's instructions; leaving the area without following any of the police officer's instructions; and seeking further information before taking any action. These behaviours are considered maladaptive because they would increase the interval between contamination and decontamination, thereby negatively affecting the effectiveness of decontamination (38-46). The items pertaining to leaving the area are considered to be a public health risk due to the risk of secondary contamination of other members of the public (47-56).

Anxiety

Anxiety will be measured using a modified version of the 6-item version of the Spielberger State-Trait Anxiety Inventory (STAI-6) (57). The scale was modified so that states are presented in the conditional rather than indicative tense, for example "I would feel calm" instead of "I feel calm". This adjustment was made because participants will be asked to reflect on how they would feel if they were in the situation presented in the video, rather than how they actually feel at the point in time when the question is presented.

Following the standard protocol for the 6-item STAI, scores for the items, "calm", "relaxed", and "content" will be reverse-coded. Scores for all items will be summed and the total multiplied by 20 then divided by 6.

Manipulation check

The messages were designed to vary in terms of the stated severity of chemical contamination, the susceptibility of the message audience to chemical contamination, and the efficacy of each protective action. There is a strong theoretical basis for self-efficacy and response cost perceptions affecting behavioural expectations in this study because the latter is a component of PMT and the former is a component of both PMT and the EPPM. Neither construct was addressed in the communication interventions because the statement that would have addressed these constructs honestly was predicated on a set of circumstances that are not guaranteed in every decontamination operation. In order to check whether the manipulations had their intended effect, participants will complete Likert scale measures pertaining to threat severity, threat susceptibility, response efficacy, self-efficacy, and response costs.

Items pertaining to perceived threat severity were adapted from items used in a pandemic flu study (36). Perceived susceptibility items were adapted from susceptibility measures used in the Risk Behavior Diagnosis Scale (58).

Three response efficacy items were adapted from response efficacy items used in a study on public reactions to a hypothetical chemical spill by Pearce et al. (21). The scale had good

internal reliability (α= .79) in a pilot study carried out as part of the development of messages used in this study.

Self-efficacy items were adapted items used in a pandemic flu study (36) and the Risk Behavior Diagnosis Scale (58). Response cost items were based on perceived response costs discussed by lay participants in a preceding interview study carried out as part of this research programme.

Trust

Items comprising the scale used to measure trust in the this study were adapted from items used in the Trust in Government scale (α = 0.91) developed by Quinn et al. (59) to cover the key determinants of trust, as outlined in the literature. In the adapted version of the scale used in the present study, the terms “government” and “swine flu” were substituted with “police officer” and either “chemical” or “emergency” respectively. On some items the tense was changed from present to past to make them more appropriate to context.

Stimulus check

Items used by Carter et al. (9) will be used to check that there are no significant differences between groups in terms of perceived realism of and emotional engagement with the scenario.

Demographic measures

Participants will be asked to state their age, gender, occupation, highest educational qualification to date, and national identity for descriptive purposes only.

Procedure

An application for ethical approval will be submitted to the King's College London Psychiatry, Nursing & Midwifery Research Ethics Panel. The protocol for the trial was submitted to the ISRCTN, in advance of data collection, on 24th October 2018 (Reference Number: 35889). The trial was registered on 7th November 2018 (https://doi.org/10.1186/ISRCTN17886859).

Randomisation and blinding

One of each intervention video (*N* = 6), labelled according to treatment cell, will be submitted to my supervisor. My supervisor will compute a block randomisation sequence of condition allocations using a randomisation programme provided by SealedEnvelope™. The order of videos will be randomised in blocks so that if the trial needs to be terminated early, the variability in number of participants between conditions is reduced.

My supervisor will order 132 videos according to the sequence specified in the randomisation. The filenames will be re-labelled with numbers from 1 to 132. A copy of the spreadsheet containing the order of random condition allocation will be stored by my first and second supervisors on separate drives. My second and third supervisors will carry out checks of the blinded video files to ensure that they correspond to the condition in the random allocation sequence.

The list of randomly ordered, coded video files will be sent from my supervisor to me via secure file transfer and stored in a folder that will be configured to not display file size, so as to reduce the risk of me unblinding myself by identifying a pattern in file sizes.

Each participant will be allocated on a consecutive basis to the next video in the sequence. To reduce the risk of human error, each video will be deleted from the sequence on viewing by each participant so that I play the first video in the list for each study session.

Study session

Potential confounds will be documented by the researcher during the course of each study session and, if applicable, recorded at the end of each study session. Each study session begins with the researcher escorting the participant from the Reception at the assessment centre to the experiment room. At the experiment room, the participant reads the information sheet and provides informed consent via an electronic form.

The participant is informed via written instruction (Appendix C) that they will be watching an immersive video through a virtual reality headset. They are asked not to reveal to the researcher any aspect of what they hear in the video in order to keep the researcher blind to condition. They are instructed to listen carefully to what is said during the video because they will answer a series of questions on completion of the video.

The participant wears the headset and watches the video whilst the researcher stands outside the room wearing closed-back headphones so that the participant can be monitored but the intervention cannot be heard by anyone other than the participant.

After watching the Intervention Video, the participant reports their answers to measures in the following order: adherence behavioural expectation; non-adherence behavioural expectation; anxiety; threat susceptibility; threat severity; response efficacy; self-efficacy; response costs; trust; emotional engagement with and perceived realism of scenario; and demographic questions.

The participant reads the debrief document then completes their expenses claim form for reimbursement of their participation. The participant is asked not to share their recollection of the content of the immersive videos with anyone else, so as to reduce the risk of demand characteristics among friends or colleagues of theirs who may participate in subsequent study sessions.

Analysis

All analyses will be carried out using IBM SPSS v25.

Data screening

Data will be screened by an independent reviewer, i.e. a member of the supervisory team who will not have been involved in data collection and will be blinded to condition allocation. Reasons for exclusion from the per protocol dataset include potential confounds documented by the researcher during data collection. The intention-to-treat dataset will be subjected to the same analyses reported below as the per protocol dataset and analyses of both datasets will be reported.

Blinding

In order to keep me blind to condition during data analysis, my supervisor will send me randomly generated codes for each level of each independent variable, along with the video filenames that correspond to each level. Codes will be generated using the website, www.randomcodegenerator.com. It will not be possible to apply blinding to the name of the independent variables because I will already be aware that there are a different number of levels for each variable.

Behavioural expectation

Scale reduction

Expectation scores for each type of behaviour, for example wanting to remain, trying to remain, and remaining in place until the shower arrives, will be subjected to reliability analysis using Cronbach's alpha. If alphas is sufficiently high (≥0.7), the three variables will be summed for each behaviour, rendering six behavioural outcome scores in total. If alpha indicates poor reliability (<0.7) for any three items, then non-parametric tests reported in the next section will be applied to each of the 18 behavioural expectation items.

The six variables will be subjected to exploratory factor analysis with varimax rotation. It is expected that there should be two factors, corresponding to two latent variables, on which all variables load with a minimum value of 0.512. This loading value threshold is based on guidelines put forward by Stevens (60) for samples of 100 (61). These latent variables are message acceptance (expecting to adhere to instructions) and message rejection (expecting to take alternative courses of action or delay adhering to instructions). If factor analysis indicates that: there are greater or less than two factors; items expected to load onto one factor actually load onto the other factor; or loading value for one or more items is less than 0.512 then the analyses outlined below will be repeated for each of the six behaviours. If factor analysis indicates that there are two latent variables and the variables load as expected then the analyses will be carried out twice; once on the sum of scores for the three message acceptance items and once for the sum of scores for the three message rejection items.

Effect of communication intervention on behavioural expectations (Hypotheses 1-7)

Parametric analysis

Bonferonni-corrected bootstrapped two-way ANOVAs will be applied to each dependent variable with threat and efficacy conditions as the independent variables. Despite there being more than one scale as a dependent variable, MANOVA was ruled out as an analysis because there was limited confidence that all scales would increase or decrease as a vector. Depending on the outcome of exploratory factor analysis, two-way ANOVA will either be applied to the sum of scores for each of the six behaviours or for the sum of summed scores for all behaviours that load onto each latent variable. If any three items pertaining to a behaviour indicate poor reliability then the non-parametric analyses reported below will be carried out.

Non-parametric analysis

Bonferonni-corrected Kruskall-Wallis *H* test will be used to test the effect of threat and Mann-Whitney U will be used to test the effect of efficacy on each behavioural expectation outcome. Bonferonni-corrected Kruskall-Wallis *H* will also be used to test the effect of communication intervention (i.e. the six threat and efficacy combinations) on each behavioural expectation outcome.

Analyses of secondary outcomes (Hypotheses 8-15)

Each secondary outcome scale, aside from the two stimulus check measures and the demographic measures, will be subjected to reliability analysis using Cronbach's alpha. If reliability is poor (<0.7) for any scale then the scale will not be included in the multiple regression analysis outlined below and items within each scale will be analysed using the non-parametric approach outlined in the section above. If reliability is sufficient (≥0.7), then the sum of items in each secondary outcome scale will be entered as the dependent variable in a Bonferonni-corrected bootstrapped two-way ANOVA with threat and efficacy condition as the independent variables.

If assumptions of multiple regression are met, stepwise multiple regression with a *ZRESID against *ZPRED plot will be carried out with the behavioural expectation outcome as dependent variable and trust, anxiety, threat severity, threat susceptibility, response efficacy, self-efficacy, and reverse-coded response costs perceptions as predictors to determine which predictors account for variance in behavioural expectation scores. The multiple regression will be repeated for each behavioural expectation outcome based on the results of the scale reduction analyses described in the previous sections.

Kruskall-Wallis *H* test will be used to check whether there is a significant difference between communication intervention on each of the two stimulus check measures.

References

1. Firestone RM, Everly GS, Jr. A pilot investigation in constructing crisis communications: What leads to best practice? International Journal of Emergency Mental Health and Human Resilience. 2013;15(2-3):159-64.
2. Omori H, Kuligowski ED, Gwynne SM, Butler KM. Human response to emergency communication: a review of guidance on alerts and warning messages for emergencies in buildings. Fire technology. 2017;53(4):1641-68.
3. Sorensen JH. Hazard warning systems: Review of 20 years of progress. Natural Hazards Review. 2000;1(2):119-25.
4. Sutton J, Gibson C, Spiro ES, League C, Fitzhugh SM, Butts CT. What it takes to get passed on: Message content, style, and structure as predictors of retransmission in the Boston Marathon Bombing response. PLoS ONE Vol 10(8), Aug 2015, ArtID e0134452. 2015;10(8).
5. Sutton J, Spiro ES, Johnson B, Fitzhugh S, Gibson B, Butts CT. Warning tweets: Serial transmission of messages during the warning phase of a disaster event. Information, Communication & Society. 2014;17(6):765-87.
6. Sutton J, Vos SC, Wood MM, Turner M. Designing Effective Tsunami Messages: Examining the Role of Short Messages and Fear in Warning Response. Weather Climate and Society. 2018;10(1):75-87.
7. Organization WH. Communicating risk in public health emergencies: a WHO guideline for emergency risk communication (ERC) policy and practice. 2017.
8. Liu BF, Quinn SC, Egnoto M, Freimuth V, Boonchaisri N. Public Understanding of Medical Countermeasures. Health Security. 2017;15(2):194-206.
9. Carter H, Drury J, Amlôt R, Rubin G, Williams R. Effective responder communication, perceived responder legitimacy, and group identification predict public cooperation and compliance in a mass decontamination visualization experiment. Journal of Applied Social Psychology. 2015;45(3):173-89.
10. Carter H, Drury J, Amlôt R, Rubin GJ, Williams R. Effective responder communication improves efficiency and psychological outcomes in a mass decontamination field experiment: Implications for public behaviour in the event of a chemical incident. PLoS ONE [Electronic Resource]. 2014;9(3):e89846.
11. Glik DC. Risk communication for public health emergencies. Annu Rev Public Health. 2007;28:33-54.
12. Mileti DS, Sorensen JH. Communication of emergency public warnings. Landslides. 1990;1(6):52-70.
13. Amlôt R, Carter H, Riddle L, Larner J, Chilcott RP. Volunteer trials of a novel improvised dry decontamination protocol for use during mass casualty incidents as part of the UK'S Initial Operational Response (IOR). PloS one. 2017;12(6):e0179309.
14. Mallett L, Vaught C, Brnich M. The emergency communication triangle. NIOSH Pub. 1999(99-157).
15. Maxwell TA. The public need to know: emergencies, government organizations, and public information policies. Government Information Quarterly. 2003;20(3):233-58.
16. Bass SB, Greener JR, Ruggieri D, Parvanta C, Mora G, Wolak C, et al. Attitudes and perceptions of urban African Americans of a "dirty bomb" radiological terror event: results of a qualitative study and implications for effective risk communication. Disaster Medicine & Public Health Preparedness. 2015;9(1):9-18.
17. McComas KA. Defining Moments in Risk Communication Research: 1996-2005. Journal of Health Communication. 2006;11(1):75-91.
18. Reynolds B, W. SEEGER M. Crisis and emergency risk communication as an integrative model. Journal of health communication. 2005;10(1):43-55.
19. Rubin GJ, Amlôt R, Page L, Wessely S. Public perceptions, anxiety, and behaviour change in relation to the swine flu outbreak: cross sectional telephone survey. Bmj. 2009;339:b2651.

20. Sherman-Morris K, Lea AM. An Exploratory Study of the Influence of Severe Weather Radar Broadcasts. Journal of Operational Meteorology. 2016;4(8):108-22.
21. Pearce JM, Rubin GJ, Amlôt R, Wessely S, Rogers MB. Communicating public health advice after a chemical spill: results from national surveys in the United Kingdom and Poland.[Erratum appears in Disaster Med Public Health Prep. 2013 Feb;7(1):112]. Disaster Medicine & Public Health Preparedness. 2013;7(1):65-74.
22. Cordasco KM, Eisenman DP, Glik DC, Golden JF, Asch SM. " They blew the levee": distrust of authorities among Hurricane Katrina evacuees. Journal of Health Care for the Poor and Underserved. 2007;18(2):277-82.
23. Latré E, Perko T, Thijssen P. Does It Matter Who Communicates? The Effect of Source Labels in Nuclear Pre-Crisis Communication in Televised News. Journal of Contingencies and Crisis Management. 2017.
24. Rubin GJ, Chowdhury AK, Amlot R. How to communicate with the public about chemical, biological, radiological, or nuclear terrorism: a systematic review of the literature. Biosecurity & Bioterrorism. 2012;10(4):383-95.
25. Rogers RW. A protection motivation theory of fear appeals and attitude change1. The journal of psychology. 1975;91(1):93-114.
26. Rogers RW. Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. Social psychophysiology. 1983:153-76.
27. Witte K. Putting the fear back into fear appeals: The extended parallel process model. Communications Monographs. 1992;59(4):329-49.
28. Witte K. Fear control and danger control: A test of the extended parallel process model (EPPM). Communications Monographs. 1994;61(2):113-34.
29. Witte K, Allen M. A meta-analysis of fear appeals: implications for effective public health campaigns. Health Educ Behav. 2000;27(5):591-615.
30. Peters G-JY, Ruiter RA, Kok G. Threatening communication: a critical re-analysis and a revised meta-analytic test of fear appeal theory. Health psychology review. 2013;7(sup1):S8-S31.
31. Peters G-JY, Ruiter RAC, Kok G. Threatening communication: a critical re-analysis and a revised meta-analytic test of fear appeal theory. Health Psychology Review. 2013;7:S8-S31.
32. Sheeran P, Harris PR, Epton T. Does heightening risk appraisals change people's intentions and behavior? A meta-analysis of experimental studies. Psychological bulletin. 2014;140(2):511.
33. Singal AG, Higgins PD, Waljee AK. A primer on effectiveness and efficacy trials. Clinical and translational gastroenterology. 2014;5(1):e45.
34. Liu BF, Fraustino JD, Jin Y. Social media use during disasters: How information form and source influence intended behavioral responses. Communication Research. 2016;43(5):626-46.
35. Gibbons F. Behavioral intentions, expectations, and willingness. Health behavior constructs: Theory, measurement, and research Bethesda, MD: National Cancer Institute Retrieved from http://cancercontrol cancer gov/brp/constructs/index html. 2006.
36. Teasdale E, Yardley L, Schlotz W, Michie S. The importance of coping appraisal in behavioural responses to pandemic flu. British journal of health psychology. 2012;17(1):44-59.
37. Ajzen I. The theory of planned behavior. Organizational behavior and human decision processes. 1991;50(2):179-211.
38. Borak J, Sidell FR. Agents of chemical warfare: sulfur mustard. Annals of emergency medicine. 1992;21(3):303-8.
39. Chan HP, Zhai H, Hui X, Maibach HI. Skin decontamination: principles and perspectives. Toxicology and industrial health. 2013;29(10):955-68.
40. Kales SN, Christiani DC. Acute chemical emergencies. New England Journal of Medicine. 2004;350(8):800-8.
41. Leary AD, Schwartz MD, Kirk MA, Ignacio JS, Wencil EB, Cibulsky SM. Evidence-based patient decontamination: an integral component of mass exposure chemical incident planning and response. Disaster medicine and public health preparedness. 2014;8(03):260-6.

42. Levitin HW, Siegelson HJ, Dickinson S, Halpern P, Haraguchi Y, Nocera A, et al. Decontamination of mass casualties—re-evaluating existing dogma. Prehospital and disaster medicine. 2003;18(3):200-7.
43. Chilcott RP. Managing mass casualties and decontamination. Environment international. 2014;72:37-45.
44. Hewitt P, Hotchkiss S, Caldwell J. Decontamination procedures after in vitro topical exposure of human and rat skin to 4, 4'-methylenebis [2-chloroaniline] and 4, 4'-methylenedianiline. Toxicological Sciences. 1995;26(1):91-8.
45. Hui X, Domoradzki JY, Maibach HC. In vitro study to determine decontamination of 3, 5-dichloro-2, 4, 6-trifluoropyridine (DCTFP) from human skin. Food and chemical toxicology. 2012;50(7):2496-502.
46. Wester RC, Hui X, Landry T, Maibach HI. In vivo skin decontamination of methylene bisphenyl isocyanate (MDI): soap and water ineffective compared to polypropylene glycol, polyglycol-based cleanser, and corn oil. Toxicological sciences: an official journal of the Society of Toxicology. 1999;48(1):1-4.
47. Chilcott RP. 20 DERMAL ASPECTS OF CHEMICAL WARFARE AGENTS. Chemical warfare agents–toxicology and treatment(Second edition), John Wiley & Sons Ltd (2007), England. 2007:409.
48. Clarke SF, Chilcott RP, Wilson JC, Kamanyire R, Baker DJ, Hallett A. Decontamination of multiple casualties who are chemically contaminated: A challenge for acute hospitals. Prehospital and disaster medicine. 2008;23(2):175-81.
49. Eckstein M. The medical response to modern terrorism: why the "rules of engagement" have changed. Elsevier; 1999.
50. Gaskin S, Heath L, Pisaniello D, Evans R, Edwards JW, Logan M, et al. Hydrogen sulphide and phosphine interactions with human skin in vitro: Application to hazardous material incident decision making for skin decontamination. Toxicology and industrial health. 2017;33(4):289-96.
51. Horton DK, Berkowitz Z, Kaye WE. Secondary contamination of ED personnel from hazardous materials events, 1995–2001. The American journal of emergency medicine. 2003;21(3):199-204.
52. Nakajima T, Sato S, Morita H, Yanagisawa N. Sarin poisoning of a rescue team in the Matsumoto sarin incident in Japan. Occupational and environmental medicine. 1997;54(10):697-701.
53. Nishiwaki Y, Maekawa K, Ogawa Y, Asukai N, Minami M, Omae K, et al. Effects of sarin on the nervous system in rescue team staff members and police officers 3 years after the Tokyo subway sarin attack. Environmental Health Perspectives. 2001;109(11):1169.
54. Okumura T, Hisaoka T, Yamada A, Naito T, Isonuma H, Okumura S, et al. The Tokyo subway sarin attack—lessons learned. Toxicology and applied pharmacology. 2005;207(2):471-6.
55. Spiandore M, Piram A, Lacoste A, Prevost P, Maloni P, Torre F, et al. Efficacy of scalp hair decontamination following exposure to vapours of sulphur mustard simulants 2-chloroethyl ethyl sulphide and methyl salicylate. Chemico-biological interactions. 2017;267:74-9.
56. Vale A, Marrs TC, Rice P. Chemical terrorism and nerve agents. Medicine. 2016;44(2):106-8.
57. Marteau TM, Bekker H. The development of a six-item short-form of the state scale of the Spielberger State—Trait Anxiety Inventory (STAI). British Journal of Clinical Psychology. 1992;31(3):301-6.
58. Witte K, McKeon J, Cameron K, Berkowitz J. The Risk Behavior Diagnosis Scale: A health educator's tool. Department of Communication Michigan State University. 1995.
59. Quinn SC, Kumar S, Freimuth VS, Kidwell K, Musa D. Public willingness to take a vaccine or drug under Emergency Use Authorization during the 2009 H1N1 pandemic. Biosecurity and bioterrorism: biodefense strategy, practice, and science. 2009;7(3):275-90.
60. Stevens J. Applied Multivariate Statistics for the Social Sciences (4th Edn), Lawrece Erlbaum Associates. Inc Publishers, Hillsdale, NJ, USA. 2002.

61. Field AP. Discovering statistics using SPSS:(and sex and drugs and rock ‘n’roll). Los Angeles [ie Thousand Oaks, Calif.]. London: SAGE Publications; 2009.

Appendix A: Power Analysis for Sample Size

[1] *-- Monday, August 13, 2018 -- 18:33:15*

F tests – ANOVA: Fixed effects, special, main effects and interactions

Analysis:	A priori: Compute required sample size		
Input:	Effect size f	=	0.35
	α err prob	=	0.05
	Power (1−β err prob)	=	0.95
	Numerator df	=	2
	Number of groups	=	6
Output:	Noncentrality parameter λ	=	15.9250000
	Critical F	=	3.0692864
	Denominator df	=	124
	Total sample size	=	130
	Actual power	=	0.9512546

Appendix B: Communication Intervention by Condition

IV1: Threat	IV2: Efficacy	
	Efficacy	No Efficacy (Control)
High-Threat	This is the police. Please listen carefully. We've been informed that a harmful chemical was released in one of the lecture theatres. We are still investigating what type of chemical it is but, based on what we know, the risk to the public is high. It can sometimes take a while to feel the effects. You might feel fine right now but still be affected. The chemical may cause painful skin burns and may even be fatal. People who come into contact with you could be exposed to the chemical. We train for this type of incident regularly. We are working with the ambulance crews to resolve the situation. We're waiting on equipment to arrive so that we can set up a shower for you. The equipment should be here in 20 minutes. There are things you can do right now that will remove the chemical from your skin. Staying here and following our instructions is the best thing you can do right now to protect yourselves. In a moment, we are going to ask you to do the following things. Please listen carefully. Most of the chemical is on your clothing. So the more clothing you remove, the more chemical you'll prevent from getting onto your skin or into your lungs. We will ask you to carefully remove as much clothing as you can, down to your underwear. Do not let the clothing touch your face. Tear or cut clothing away from the body instead of lifting it over your head. If you have to lift it over your head then hold your breath, close your eyes and mouth, and hold the clothing away from your face. A decontamination shower is on the way. Brushing the skin with dry paper is a safe and effective way to remove some of the chemical from your skin before showering.	This is the police. Please listen carefully. We've been informed that a harmful chemical was released in one of the lecture theatres. We are still investigating what type of chemical it is but, based on what we know, the risk to the public is high. It can sometimes take a while to feel the effects. You might feel fine right now but still be affected. The chemical may cause painful skin burns and may even be fatal. People who come into contact with you could be exposed to the chemical. We train for this type of incident regularly. We are working with the ambulance crews to resolve the situation. We're waiting on equipment to arrive so that we can set up a shower for you. The equipment should be here in 20 minutes. We are still currently looking into the cause of the incident. We are also looking into the source of the chemical and the precise time when the incident was reported. In a moment, we are going to ask you to do the following things. Please listen carefully. If you have just arrived, please stay where you are and listen out for updates. We are currently investigating this incident. We will be giving you some instructions in a moment. Please listen. We will ask you to carefully remove as much clothing as you can, down to your underwear. Do not let the clothing touch your face. Tear or cut clothing away from the body instead of lifting it over your head. If you have to lift it over your head then hold your breath, close your eyes and mouth, and hold the clothing away from your face. A decontamination shower is on the way. We are investigating what type of chemical this is and the cause of the incident. Remain where you are and listen out for further instructions.

IV1: Threat	IV2: Efficacy	
	Efficacy	No Efficacy (Control)
	We will ask you to use the tissue paper on the ground to brush your skin. Start by brushing your hands and then use a new piece of paper to brush your face. Repeat this process from your neck down to your toes. If anyone requires assistance, please ask someone next to you. After using the tissue paper, going through a decontamination shower is the best way to ensure that you are thoroughly cleaned. A shower is on its way here now. Please remain where you are and start removing your clothing…	We will ask you to use the tissue paper on the ground to brush your skin. Start by brushing your hands and then use a new piece of paper to brush your face. Repeat this process from your neck down to your toes. If anyone requires assistance, please ask someone next to you. Listen out for further updates. We are looking into the situation to find out more about what has happened here. A shower is on its way here now. Please remain where you are and start removing your clothing…
Low-Threat	This is the police. Please listen carefully. We've been informed that a chemical may have been released in one of the lecture theatres. We are still investigating what type of chemical it is but, based on what we know, the risk to the public is low. Had you been exposed to the substance, you would have felt some symptoms by now. You will probably be fine but we will still need to take some precautions. The instructions we are about to give you are a precaution. We train for this type of incident regularly. We are working with the ambulance crews to resolve the situation. We're waiting on equipment to arrive so that we can set up a shower for you. The equipment should be here in 20 minutes. There are things you can do right now that would remove the chemical from your skin. Staying here and following our instructions is the best precaution you can take right now to protect yourselves. In a moment, we are going to ask you to do the following things. Please listen carefully. Most of the chemical would be on your clothing. So the more clothing you remove, the more chemical you'd prevent from getting onto your skin or into your lungs.	This is the police. Please listen carefully. We've been informed that a chemical may have been released in one of the lecture theatres. We are still investigating what type of chemical it is but, based on what we know, the risk to the public is low. Had you been exposed to the substance, you would have felt some symptoms by now. You will probably be fine but we will still need to take some precautions. The instructions we are about to give you are a precaution. We train for this type of incident regularly. We are working with the ambulance crews to resolve the situation. We're waiting on equipment to arrive so that we can set up a shower for you. The equipment should be here in 20 minutes. We are still currently looking into the cause of the incident. We are also looking into the source of the chemical and the precise time when the incident was reported. In a moment, we are going to ask you to do the following things. Please listen carefully. If you have just arrived, please stay where you are and listen out for updates. We are currently investigating this incident. We will be giving you some instructions in a moment. Please listen.

IV1: Threat	IV2: Efficacy	
	Efficacy	No Efficacy (Control)
	We will ask you to carefully remove as much clothing as you can, down to your underwear. Do not let the clothing touch your face. Tear or cut clothing away from the body instead of lifting it over your head. If you have to lift it over your head then hold your breath, close your eyes and mouth, and hold the clothing away from your face. A decontamination shower is on the way. Brushing the skin with dry paper is a safe and effective way to remove some of the chemical from your skin before showering. We will ask you to use the tissue paper on the ground to brush your skin. Start by brushing your hands and then use a new piece of paper to brush your face. Repeat this process from your neck down to your toes. If anyone requires assistance, please ask someone next to you. After using the tissue paper, going through a decontamination shower is the best way to ensure that you are thoroughly cleaned. A shower is on its way here now. Please remain where you are and start removing your clothing…	We will ask you to carefully remove as much clothing as you can, down to your underwear. Do not let the clothing touch your face. Tear or cut clothing away from the body instead of lifting it over your head. If you have to lift it over your head then hold your breath, close your eyes and mouth, and hold the clothing away from your face. A decontamination shower is on the way. We are investigating what type of chemical this is and the cause of the incident. Remain where you are and listen out for further instructions. We will ask you to use the tissue paper on the ground to brush your skin. Start by brushing your hands and then use a new piece of paper to brush your face. Repeat this process from your neck down to your toes. If anyone requires assistance, please ask someone next to you. Listen out for further updates. We are looking into the situation to find out more about what has happened here. A shower is on its way here now. Please remain where you are and start removing your clothing…
Neutral-Threat	This is the police. Please listen carefully. We've been informed that a chemical may have been released in one of the lecture theatres. We are still investigating what type of chemical it is, where the chemical would have originated, and what time it would have been released. Please stay where you are and listen for updates. If you have just arrived, please remain where you are. We will update you when we know more about the situation. Listen out for updates and instructions. We train for this type of incident regularly. We are working with the ambulance crews to resolve the situation. We're waiting on equipment to arrive so that we can set up a shower for you. The equipment should be here in 20 minutes.	This is the police. Please listen carefully. We've been informed that a chemical may have been released in one of the lecture theatres. We are still investigating what type of chemical it is, where the chemical would have originated, and what time it would have been released. Please stay where you are and listen for updates. If you have just arrived, please remain where you are. We will update you when we know more about the situation. Listen out for updates and instructions. We train for this type of incident regularly. We are working with the ambulance crews to resolve the situation. We're waiting on equipment to arrive so that we can set up a shower for you. The equipment should be here in 20 minutes.

IV1: Threat	**IV2: Efficacy**	
	Efficacy	No Efficacy (Control)
	There are things you can do right now that would remove the chemical from your skin. Staying here and following our instructions is the best precaution you can take right now to protect yourselves. In a moment, we are going to ask you to do the following things. Please listen carefully. Most of the chemical would be on your clothing. So the more clothing you remove, the more chemical you'd prevent from getting onto your skin or into your lungs. We will ask you to carefully remove as much clothing as you can, down to your underwear. Do not let the clothing touch your face. Tear or cut clothing away from the body instead of lifting it over your head. If you have to lift it over your head then hold your breath, close your eyes and mouth, and hold the clothing away from your face. A decontamination shower is on the way. Brushing the skin with dry paper is a safe and effective way to remove some of the chemical from your skin before showering. We will ask you to use the tissue paper on the ground to brush your skin. Start by brushing your hands and then use a new piece of paper to brush your face. Repeat this process from your neck down to your toes. If anyone requires assistance, please ask someone next to you. After using the tissue paper, going through a decontamination shower is the best way to ensure that you are thoroughly cleaned. A shower is on its way here now. Please remain where you are and start removing your clothing…	We are still currently looking into the cause of the incident. We are also looking into the source of the chemical and the precise time when the incident was reported. In a moment, we are going to ask you to do the following things. Please listen carefully. If you have just arrived, please stay where you are and listen out for updates. We are currently investigating this incident. We will be giving you some instructions in a moment. Please listen. We will ask you to carefully remove as much clothing as you can, down to your underwear. Do not let the clothing touch your face. Tear or cut clothing away from the body instead of lifting it over your head. If you have to lift it over your head then hold your breath, close your eyes and mouth, and hold the clothing away from your face. A decontamination shower is on the way. We are investigating what type of chemical this is and the cause of the incident. Remain where you are and listen out for further instructions. We will ask you to use the tissue paper on the ground to brush your skin. Start by brushing your hands and then use a new piece of paper to brush your face. Repeat this process from your neck down to your toes. If anyone requires assistance, please ask someone next to you. Listen out for further updates. We are looking into the situation to find out more about what has happened here. A shower is on its way here now. Please remain where you are and start removing your clothing…

Appendix C: Outcome Measure Survey

Instructions

You are about to watch an immersive video of an emergency scenario.

Please remain seated until the headset is removed.

On completion of the video, it is important that you do not tell the researcher what you heard during the video.

The researcher will be outside the room during the presentation of the video. When it is time to inform that the researcher that the video has ended, please raise your hand.

Please listen carefully during the video as you will be asked questions about what you hear.

When you are ready to begin the video, please let the researcher know.

Behavioural Expectations

Think about what you would do if the scenario carried on from the point that the video stopped. Imagine you are still standing outside.

For each of the following statements, please select an option that best represents how you would feel in that moment.

Please answer honestly.

I would remain where I am until the shower arrives

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **try** to remain where I am until the shower arrives

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **want** to remain where I am until the shower arrives

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
- Agree (6)
- Strongly agree (7)

I would remove my clothing, down to my underwear

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
- Agree (6)
- Strongly agree (7)

I would **try** to remove my clothing, down to my underwear

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **want** to remove my clothing, down to my underwear

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would brush my skin with the tissue paper

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **try** to brush my skin with the tissue paper

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **want** to brush my skin with the tissue paper

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would go straight to the nearest hospital without following any of the police officer's instructions

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **try** to go straight to the nearest hospital without following any of the police officer's instructions

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **want** to go straight to the nearest hospital without following any of the police officer's instructions

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would leave the area without following any of the police officer's instructions

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **try** to leave the area without following any of the police officer's instructions

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **want** to leave the area without following any of the police officer's instructions

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
- Agree (6)
- Strongly agree (7)

I would seek further information before taking any action

- Strongly disagree (1)
- Disagree (2)
- Somewhat disagree (3)
- Neither agree nor disagree (4)
- Somewhat agree (5)
- Agree (6)
- Strongly agree (7)

I would **try** to seek further information before taking any action

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would **want** to seek further information before taking any action

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

STAI-6

For each of the statements below, please select an option that best describes how you would feel by the end of the scenario shown in the video

	Not at all (1)	Somewhat (2)	Moderately (3)	Very much (4)
I would feel calm (1)	○	○	○	○
I would be tense (2)	○	○	○	○
I would feel upset (3)	○	○	○	○
I would be relaxed (4)	○	○	○	○
I would feel content (5)	○	○	○	○
I would be worried (6)	○	○	○	○

Threat Susceptibility

Based on what you heard in the video, how likely or unlikely is it that you had been exposed to the chemical?

- ○ Extremely unlikely (1)
- ○ Moderately unlikely (2)
- ○ Slightly unlikely (3)
- ○ Neither likely nor unlikely (4)
- ○ Slightly likely (5)
- ○ Moderately likely (6)
- ○ Extremely likely (7)

Based on what you heard in the video, to what extent do you agree or disagree with the following statements?

I was at risk for being exposed to the chemical

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

It is possible that I had been exposed to the chemical

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Threat Severity

If I don't take protective action, I am likely to become seriously ill

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

If I don't take protective action, there will be severe consequences for my health

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

If I don't take protective action, the chemical will cause me serious problems

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Response Efficacy

Staying where I am and following instructions would help to protect me if I had been exposed to the chemical

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Removing the clothing that I am wearing would help to protect me if I had been exposed to the chemical

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Brushing my skin with tissue paper would help to protect me if I had been exposed to the chemical

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

To what extent do you agree or disagree with the following statements about how you would feel at this point in the scenario?

Self-Efficacy

It would be possible for me to follow all of the instructions that I heard

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

If I wanted to, I am confident that I would be able to follow all of the instructions that I heard

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I can easily follow all of the instructions that I heard

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Response Costs

It would be embarrassing for me to remove my clothing in this situation

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

I would be concerned about removing my clothing in front of the other people in this situation

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Trust

The next questions are about the police officer who was talking to you in the video

How open do you think the police officer was with information regarding the chemical?

- ○ Not at all open (1)
- ○ Somewhat open (2)
- ○ Open (3)
- ○ Very open (4)

How honest do you think the police officer was with information regarding the chemical?

- ○ Not at all honest (1)
- ○ Somewhat honest (2)
- ○ Honest (3)
- ○ Very honest (4)

How competent do you believe the police officer was in handling the emergency?

- ○ Not at all competent (1)
- ○ Somewhat competent (2)
- ○ Competent (3)
- ○ Very competent (4)

How committed do you believe the police officer was to protecting you from the chemical?

- ○ Not at all committed (1)
- ○ Somewhat committed (2)
- ○ Committed (3)
- ○ Very committed (4)

How much caring and concern do you think the police officer has shown about people who might be affected by the chemical?

- ○ Not at all caring (1)
- ○ Somewhat caring (2)
- ○ Caring (3)
- ○ Very caring (4)

How much do you believe that the police officer's actions in response to the emergency are in your personal best interest?

- ○ Not at all (1)
- ○ To some extent (2)
- ○ In my best interest (3)
- ○ Absolutely in my best interest (4)

How much do you believe the police officer will protect you from the chemical?

- ○ Not at all (1)
- ○ Somewhat (2)
- ○ Yes, will protect me (3)
- ○ Absolutely will protect me (4)

Stimulus check

To what extent do you agree or disagree with the following statements about the immersive video that you watched during this study?

I felt emotionally engaged with the video

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

The video accurately resembled how I would imagine a real chemical incident to be

- ○ Strongly disagree (1)
- ○ Disagree (2)
- ○ Somewhat disagree (3)
- ○ Neither agree nor disagree (4)
- ○ Somewhat agree (5)
- ○ Agree (6)
- ○ Strongly agree (7)

Demographic questions

What is your age in years?

At birth were you described as...

- ○ Female (1)
- ○ Male (2)
- ○ Intersex (3)
- ○ I prefer not to say (4)

Which of the following describes how you think of yourself?

- ○ Female (1)
- ○ Male (2)
- ○ In another way (please specify) (3) _____

Which of these options best describes your current status?

- ○ Full-time employed (1)
- ○ Part-time emplyoed (2)
- ○ Self-employed (full or part-time) (3)
- ○ Full-time education at college or university (4)
- ○ Unemployed (5)
- ○ Retired from paid work (6)
- ○ On a government supported training programme (7)
- ○ Employed (full or part-time) and on long-term leave (8)
- ○ Other (please specify) (9)

_____

What is your highest educational qualification achieved to date?

If you are currently working towards a qualification, please select this option from the list below

- ○ GCSE or equivalent (1)
- ○ A-Level, AS-Level, or equivalent (2)
- ○ Professional qualification (3)
- ○ Trade apprenticeship (4)
- ○ Undergraduate degree (5)
- ○ Postgraduate degree or higher (6)
- ○ Other UK qualification (please specify) (7) _____
- ○ Other non-UK qualification (please specify) (8) _____

How would you describe your national identity?

- ○ English (1)
- ○ Welsh (2)
- ○ Scottish (3)
- ○ Northern Irish (4)
- ○ British (5)
- ○ Other (please specify) (6) _____

Before participating in this study, had you heard any information about the study, besides the information in the information sheet or information provided by the researcher?

- ○ No (1)
- Yes, Please briefly specify: (2)