**Supplementary Materials**

**1. Detailed Search Strategy**

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| **Database** | **Detailed Search Strategy** |
| PubMed | #1: "Disasters"[Mesh] OR "Disaster Medicine"[Mesh]#2: mass casualty\*[Title/Abstract] OR multi-casualty[Title/Abstract] OR catastrophe[Title/Abstract] OR major event\*[Title/Abstract] OR disaster\*[Title/Abstract]#3: "Simulation Training"[Mesh]#4: simulat\*[Title/Abstract] OR exercise\*[Title/Abstract] OR drill\*[Title/Abstract]#5: #1 OR #2#6: #3 OR #4#7: #5 AND #6 |
| Embase | #1: 'disaster'/exp OR 'disaster medicine'/exp#2: 'mass casualt\*':ab,ti OR 'multi casualt\*':ab,ti OR catastrophe:ab,ti OR 'major event\*':ab,ti OR disaster\*:ab,ti#3: 'simulation training'/exp#4: simulat\*:ab,ti OR exercise\*:ab,ti OR drill\*:ab,ti#5: #1 OR #2#6: #3 OR #4#7: #5 AND #6 |
| Web of Science | #1: TS=("mass casualt\*" OR "multi casualt\*" OR catastrophe OR "major event\*" OR disaster\*)#2: TS=(simulat\* OR exercise\* OR drill\*)#3: #1 AND #2#4: #1 AND #2 and Emergency Medicine or Nursing or Critical Care Medicine or Surgery or Health Care Sciences Services or Pediatrics or Health Policy Services or Anesthesiology or Psychiatry or Psychology or Infectious Diseases or Dermatology or Hematology or Orthopedics or Toxicology or Oncology or Rehabilitation or Obstetrics Gynecology or Tropical Medicine or Medicine General Internal (Web of Science Categories) |

**2. Scenarios of Full Scale Exercises**

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| **Publication Year** | **First Author** **(Last Name)**  | **Scenario of Full Scale Exercise**  | **Number of Site** |
| 2005 | Alexander | Two gunmen shot random victims and detonated a bomb in a high school | Single |
| 2009 | Lenz | Biohazard exposure in an elementary school | Single |
| 2010 | Gryth | Commercial passenger aircraft crashed land at a major airport due to technical problems | Single |
| 2010 | Ingrassia | Explosive blast in a two-story building with chemical release | Single |
| 2012 | Rutty | Conventional and contaminated casualties# | Single |
| 2012 | Klima | Terrorist explosion with train derailment onto the major interstate highway and chemical release | Single |
| 2012 | Radestad | Aircraft carrying passengers and crew crashed during a landing attempt at an airport  | Single\* |
| 2013 | Austin | A tornado that severely damaged the community, some campus buildings, and a local hospital | Single |
| 2014 | Shah | Chlorine overexposure at a public swimming pool | Single |
| 2014 | Austin | Non-terrorist explosion | Single |
| 2014 | Djalali | An explosion of a gas station  | Single |
| 2016 | Daniel | Church congregation with flu like symptoms after trip to an area endemic to Avian flu in China | Single |
| 2017 | Wenham | Traffic accident involving truck and school bus on highway | Single |
| 2017 | Saber | Bus crash | Single |
| 2019 | McElroy | Simultaneous terrorist attacks at distant sites throughout the city – a university student rally, a stadium hosting a soccer tournament, and a 5 kilometers road race at an airport | 3 sites |
| 2020 | Lenz | Active shooter | Single~ |
| 2020 | Carenzo | Tsunami – two urban scenarios (building collapse, medical facility collapse) and two coastal events (casualties lost at sea, casualties crashed on a pier) | 4 sites |
| 2020 | Sheikhbardsiri | Richter scale 6.4 earthquake with collapse of buildings and infrastructures – city divided into four districts and each a staging area | 4 sites |
| 2021 | Foo | Richter scale 7 earthquake with collapse of buildings, power outages and casualties in multiple districts – scene A collapsed buildings and serious traffic accidents; scene B landslides in village | 2 sites |
| 2021 | Innis | Blast at a high rise apartment building | Single |

# – Details not mentioned

\* – Two separate single site full-scale exercises in 2008 and 2010

 ~ – Eighteen scenarios choreographed to be the same

**3. Evaluators of Full Scale Exercises**

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| --- | --- | --- | --- | --- |
| **Year Published** | **First Author (Last Name)** | **Background of Evaluators** | **Training of Evaluators** | **Number of Evaluators** |
| 2005 | Alexander | Faculty supervisors of emergency medicine residents | - | 17 |
| 2009 | Lenz | - | Yes but no details mentioned | 18 |
| 2010 | Gryth | Experienced observers but no details | Yes but no details mentioned | - |
| 2010 | Ingrassia | Three physicians with experience in disaster management and four medical students with a special interest in disaster medicine | Yes but no details mentioned | 7 |
| 2012 | Rutty | - | - | - |
| 2012 | Klima | Experienced third-party contracted evaluators but no details | - | - |
| 2012 | Radestad | Registered nurses and doctors certified as instructors in a Swedish national concept in disaster preparedness | All trained in a standardized way at a national disaster medicine centre  | - |
| 2013 | Austin | - | - | - |
| 2014 | Shah | Selected from various agencies typically involved in disasters (e.g. Fire Department, Department of Health, Emergency Medical Services) | Prior to initiation of the exercise, evaluators were instructed as to what the optimal response of the institution to a mass-casualty event would be | - |
| 2014 | Austin | Representatives from local office of emergency management, local health department, State department of health and mental hygiene, and state emergency medical services | - | - |
| 2014 | Djalali | Experts in emergency and disaster medicine with Master’s degrees in disaster medicine | - | 3 |
| 2016 | Daniel | - | - | - |
| 2017 | Wenham | - | - | - |
| 2017 | Saber | Nursing school faculty but no details  | - | - |
| 2019 | McElroy | - | - | - |
| 2020 | Lenz | Subject matter experts but no details mentioned | - | - |
| 2020 | Carenzo | - | - | - |
| 2020 | Sheikhbardsiri | Skilled members with academic education in the fields of emergencies and disasters | - | 12 |
| 2021 | Foo | Six experts from Taiwan’s Society of Emergency Medicine and a non-governmental expert from Hong Kong well trained in humanitarian relief missions | - | 7 |
| 2021 | Innis | - | - | - |