

Vakkalanka JP, Parker Cote JL, Schwartz R, King JD, Charlton NP, Holstege CP. Chemical and Biological Terrorist Attacks Identified through the Global Terrorism Database. Oral presentation at the International Congress of the European Association of Poisons Centres and Clinical Toxicologists. 2015, St. Julian's, Malta.

Objective: The purpose of this study was to characterize all biological and chemical terrorist attacks reported to the Global Terrorism Database (GTD)¹.

Methods: The GTD was queried for biological or chemical terrorist attacks occurring between calendar years 1970 and 2012. Biological agents were further classified to include *anthrax*, *botulinum toxin*, and *salmonella*. Chemical agents included *acid/alkaline corrosives*, *arsenic*, *cyanide*, *heavy metals*, *irritants*, *organophosphates*, *ricin*, and *vesicants*. Unknown substances were classified as *unknown*, *unknown gas*, or *other*. Trends in terrorist attacks, non-fatalities, and fatalities were evaluated by region, year, type of agent, and attack/target type.

Results: A total of 223 (chemical agents, n=191, 85.7%; biological agents, n=32, 14.3%) terrorist attacks were identified, accounting for 416 deaths and 10,358 non-fatal casualties. One-third of the attacks (n=74) utilized unknown gases or chemical agents, followed by irritants (n=39, 17.5%), acid/alkaline corrosives (n=32, 14.3%), and cyanide (n=24, 10.8%). Among known agents, irritants resulted in the largest proportion of fatalities (n=82, 19.7%). Biological agents only accounted for 2.2% of all fatalities, and were predominantly identified among North American attacks (anthrax, n= 12, 40.0%; salmonella, n=4, 13.3%). Acid/alkaline corrosives were most frequently reported in South Asia (n=12, 37.5%) and Western Europe (n=8, 25.0%), while irritants were the dominant agent in Western Europe (n=15, 38.5%) and South America (n=8, 20.5%). Unknown gases, however, were frequently used in South Asia (n=9, 37.5%) and East Asia (n=8, 33.3%). Countries with most reported incidents included Afghanistan (n=26, 11.7%), the United States (n=29, 13.0%), and Germany (n=14, 6.3%). Japan accounted for 65.1% (n=6,744) of all wounded individuals, while Uganda (n=200, 48.1%) and Columbia (n=71, 17.1%) reported the majority of fatalities.

Discussion: Although chemical and biological agents are a small subset of GTD, they have contributed to significant morbidity and mortality. For example, the deadly Sarin gas attacks in Japan from 1995 injured 5,500 and 671 people, respectively. As identified through this study, agents used in these attacks varied by region, and identifying these patterns may aid local and international authorities in preparation and response to terrorist attacks. Training responders and allocating resources may be focused on the predominant agent within the region (e.g. acid/alkaline corrosives in South Asia and Western Europe; irritants in Western Europe, South America, and North Africa/Middle East; unknown gases in South/East Asia).

Conclusion: By epidemiological characterization of the chemical and biological attacks in the GTD, key trends will assist local authorities in preparation and prevention of terrorist attacks.

References:

1. National Consortium for the Study of Terrorism and Responses to Terrorism (START). (2013). Global Terrorism Database [Data file]. Retrieved from <http://www.start.umd.edu/gtd>