Effectiveness of Unarmed Response to Active Shooter Incidents

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Model Methodology

• Created an agent-based model replicating an open area with high pedestrian traffic with police presence.
• The model has a default value of one shooter agent, two police officers, and 500 civilians entering the model at 1000 agents per hour.
• All agents enter the model via random entrance/exit.
• The police agents patrol the model by continued selection of random patrol checkpoints.
• After 10 minutes of model runtime, the shooter moves to the center of the model. Upon arrival, the shooter begins to discharge at both the police officer and the civilians.
• The civilian’s cognitive and the police response time delay is set to 0 and can be adjusted by the user.
• The civilians escape by running toward the nearest entrance/exit while the police agents move toward the shooter.

Agents in Model
1. Active Shooter
2. Unarmed Civilians
3. Police Officers

Notes
• Either the police and the shooter can discharge at one another.
• The shooter is stationary in this model during discharge.

Results
• The civilian cognitive delay increases the casualty rate in contrast to the immediate action of running away from the threat.
• The police response delay increased the casualty rate, however, less significant when the civilians escape immediately.
• The shooter’s rate of discharge increased the number of casualties rate despite capacity or the power of the weapon.

Recommendations
• Educate the public on how to recognize the sound of a firearm and the importance of immediate evacuation.
• Create physical obstacles in an open area for civilians to seek shelter.
• Assign patrol details at a vantage point to locate the shooter to decrease response time.

Future Research
• Model RunHideFight unarmed response to test the model’s to lower the casualty rate in contrast to evacuation.
• Assess the minimum number of police agents necessary to apprehend the shooter.