Developing a Tool for Improved Mental Health Crisis Response

Julia Krostich, Toni Levisman and Dr. Veronica M. White

Introduction

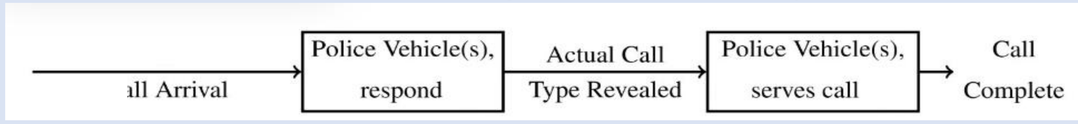
- Mental and behavioral Crisis calls are calls to an emergency service incited by a mental health concern. Literature supports that crisis call outcomes can be improved.
- 998, the suicide and crisis lifeline, has accepted 10.8 million calls since 2022. The vast number of calls demonstrates the need for a focus on the efficiency of crisis calls (Sanders, 2024).
- Crisis calls are complex and are historically responded to inconsistently. For example, in the United States, mental health crisis response has many models and lacks standardization (Currey et al., 2023). One such inconsistency is who responds to crisis calls, whether the response simply include officers, mental health professionals, or both.
- This project aims to create a crisis planning tool to improve call outcomes and standardize police response to mental health emergencies.
- In this project, four different response models are studied, including the:
- Police Response Model (PRM)
  - Queuing system where all calls can request any number of servers.
- Conditional Crisis Response Model (CCRM)
  - Police response based on severity of crisis and availability of vehicles.
- Joint-Response Model (JRM)
  - Police serve NC call and call is removed from queuing.
  - For a C call, police request a crisis unit and serve if they can't come.
- Follow-Up Response Model (FRM)
  - For C calls, police arrive and wait for crisis unit and can answer other calls when the crisis unit arrives (White & Albert, 2024).
- Creating a model of a complex system allows it to be simplified into inputs and outputs and allows insight into the behavior of the system (Ingalls, 2011).
- Simulation, which models the dynamic nature of a system, is used to model the four response types. These Models test the effect of changing variables of interest on the performance of a system.
- Ideally, the tool would prevent consequences such as unnecessary hospitalizations, arrests, or fatalities.

Methodology

- Literature review was conducted to support the effectiveness of a simulation-based tool for assisting in police response model selection.
- R Studio and R Shiny were used to develop the interactive portion of the tool and prepare it for use by police departments.
- Data for the tool is pulled from a Seattle, WA-based case study. The study includes four models of police response.

Preliminary Results

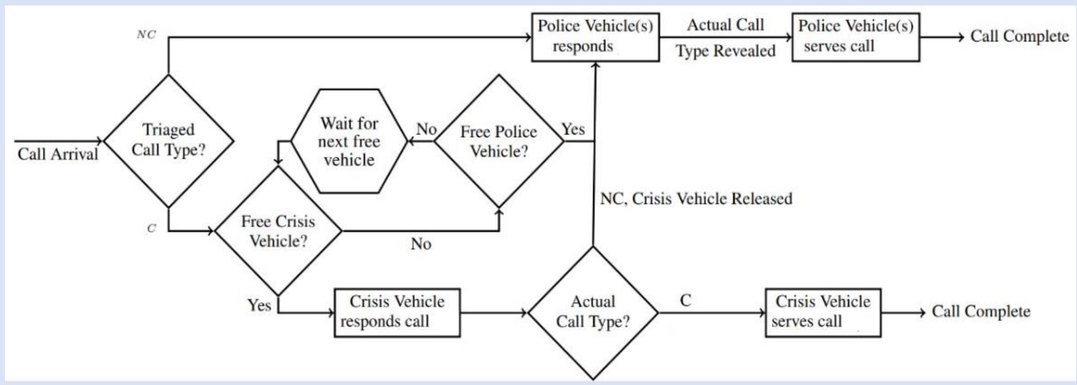
- Based on the literature review, current response technique to mental health crisis is not effectively handled. A simulation tool can be a more effective way to respond to mental health crisis calls because it relieves confusion of how to respond and makes more direct, standardized connections between emergency departments.
- The tool compares the PRM in figure 1 against other response such the Conditional crisis response model as shown in Figure 2
- A preliminary radar chart was created, with each radius representing a variable for call outcome. These outcomes and measures are derived from the simulation, using data from the Seattle, WA study..



Note. From "Evaluating co-response models for crisis calls," by V.M. White & L.A. Albert

Figure 1: PRM

- A queuing network is a flow through a waiting line.
- Queuing network of police response model of single call server's response to all call types.
- After a call arrives, the police vehicles respond.
- After the police vehicles respond, the reason and type of call is revealed, and the police vehicle can provide service before the call ends (White & Albert, 2024).



Note. From "Evaluating co-response models for crisis calls," by V.M. White & L.A. Albert

Figure 2: CCRM

- NC represents a non-crisis, and C indicated a crisis call type.
- In the CCRM, call dispatch decisions change based on if the call is C or NC, vehicle availability, and the type of call.
- Compared to the PRM, the CCRM has different responses based on the level of urgency and resources available.
- If there is a NC call, the PRM model steps are followed.
- If there is a C and a crisis vehicle is free, the vehicle responds based on the actual call type and the vehicle serves the call before the call is complete.
- If there is a C and there is no vehicle available, there is a wait for the next vehicle when there is a police vehicle free (White & Albert, 2024).

Discussion

- The literature review indicated that a simulation tool can improve efficiency and quality of mental health crisis call response.
- With the visualization of these response models, the crisis intervention tool can become better suited to be used by the public through visual clarity.
- The CCRM, FRM, JRM, and PRM charts will be combined into a single interactive tool and suitable for data input.

Future work

- Radar chart development will continue with the goal of creating a functioning interactive tool with R Shiny.
- Bar charts will be made in R studio to improve user interaction and understanding with the simulation tool.

References

Curry, J., Sloan, L., Rush, W.K., & Gulrajani, C. (2023). The Changing Landscape of Mental Health Crisis Response in the United States. Journal of the American Academy of Psychiatry and the Law Online, 51(1), 6-12. https://doi.org/10.29158/JAAPL.220111-22

Ingalis, R. G. (2011). Introduction to simulation. Proceedings of the 2011 Winter Simulation Conference (WSC), 1347-1388 https://doi.org/10.1109/WSC.2011.6147858

Saunders, H. (2024, July 29). 988 Suicide & Crisis Lifeline: Two Years After Launch. KFF. https://www.kff.org/mental-health/issue-brief/988-suicide-crisis-lifeline-two-years-afterlaunch/

White VM, Albert LA (2024) Evaluating co-response models for crisis calls. 2024 (Montreal, Canada).