

## Introduction

In the context of climate-change induced weather emergencies, this project seeks to understand how AI-generated emergency-preparedness communication can be used to effectively reach underserved communities, particularly those whose primary language is not English or Spanish. The research will focus on developing and testing responsive and culturally relevant AI messages intended to reach underserved communities with warnings and alerts published in their preferred language about how to respond safely to extreme weather events[1]. It will also explore the propensity of AI to improve emergency-preparedness in underserved populations, particularly in ways that promote equity.

## Research Goal

The aim of our research is to measure audience attitudes, cognitions, and behaviors related to AI-generated emergency preparedness messaging and to develop and test responsive and culturally relevant AI messages intended to reach underserved communities in Austin with warnings and alerts published in their preferred language.

## Methods

Our methods include distributing surveys with incentives for a broad response rate, creating culturally tailored ad content with native speaker consultation, employing ad performance analytics for real-time refinement, engaging communities for qualitative insights into communication strategy effectiveness, and iteratively developing the AI chatbot with user feedback.

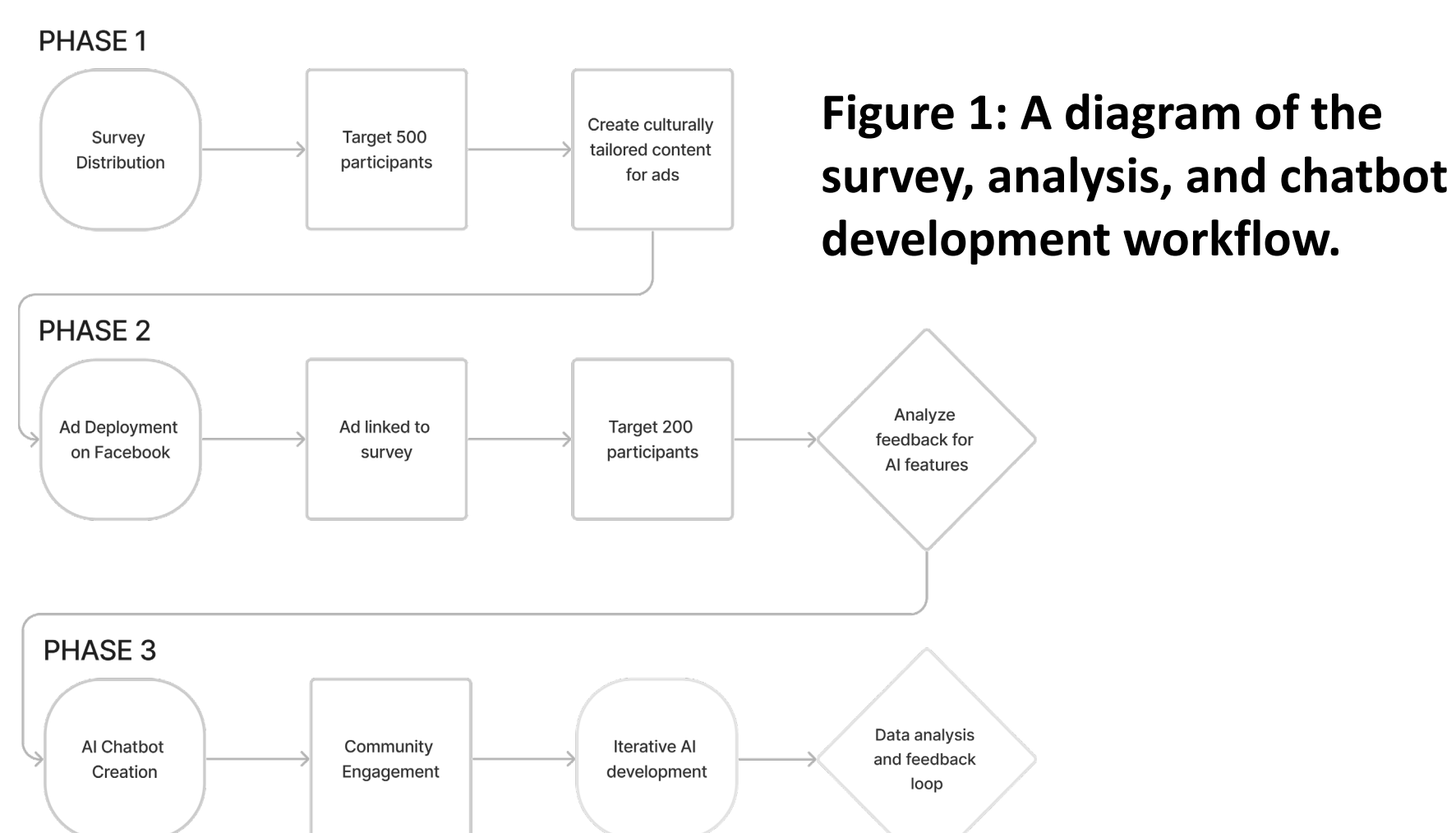


Figure 1: A diagram of the survey, analysis, and chatbot development workflow.

## Project Overview

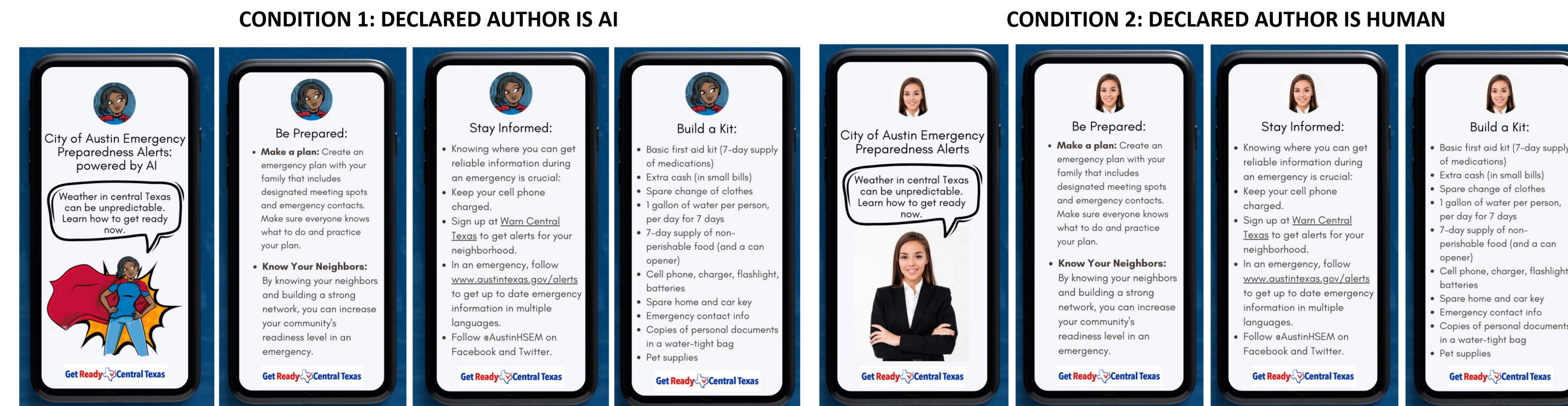


Figure 2: Survey example for human-declared author measuring trust.

Figure 3: Survey example for AI-declared author measuring trust.

Our project consists of three phases: surveys and analytics, ad messaging and feedback, and chatbot creation and validation. The first two phases will provide critical insights into the current state of emergency preparedness among diverse linguistic communities in Austin, while the third phase will implement and test an innovative solution to improve this preparedness through technology.

The first study involves a two-phase survey of Austin residents (n=500) who speak priority languages other than English at home, including Arabic, Burmese, Chinese, Hindi, Korean, French, Vietnamese and Spanish<sup>1</sup>. The first phase of Study 1 will generate a baseline understanding of priority-language speakers' attitudes, cognitions and behaviors related to weather emergency preparedness, government trust and AI communication[2][3].

Building on the insights of the first study, Study 2 tests the efficacy of real-world emergency response messaging in Austin posted via Facebook ads. We target the campaign for February 2024, which historical weather data has shown to be a common month for atypically cold weather, bringing about unexpected freezes that can put extreme pressure on the city's infrastructure, including its water supply, power lines and emergency response staff. Ads will be targeted to Austin zip codes where Arabic, Burmese, Chinese, Hindi, Korean, French, Vietnamese and Spanish are spoken at home.

The third study extends the real-world insights of Study 2 by testing which features of an interactive, AI-generated chatbot are most effective at promoting attitude and behavior change related to extreme weather event preparedness among our eight priority-language speakers. An AI chatbot will be developed and validated on its ability to provide accurate emergency information in each of the priority languages[4].

With the completion of these three studies, our project aims not only to enhance the emergency preparedness of Austin's diverse linguistic communities but also to establish a scalable model that can be adapted to other regions and languages. The integration of direct community feedback, targeted communication strategies, and AI technology presents a comprehensive approach to addressing the critical challenge of emergency preparedness in diverse urban populations.

<sup>1</sup> The languages for all three studies are determined with City of Austin personnel based on identified needs.



Figure 4: A sample conversation with Austin Emergency Response AI in Chinese, a priority language, about flooding in homes.

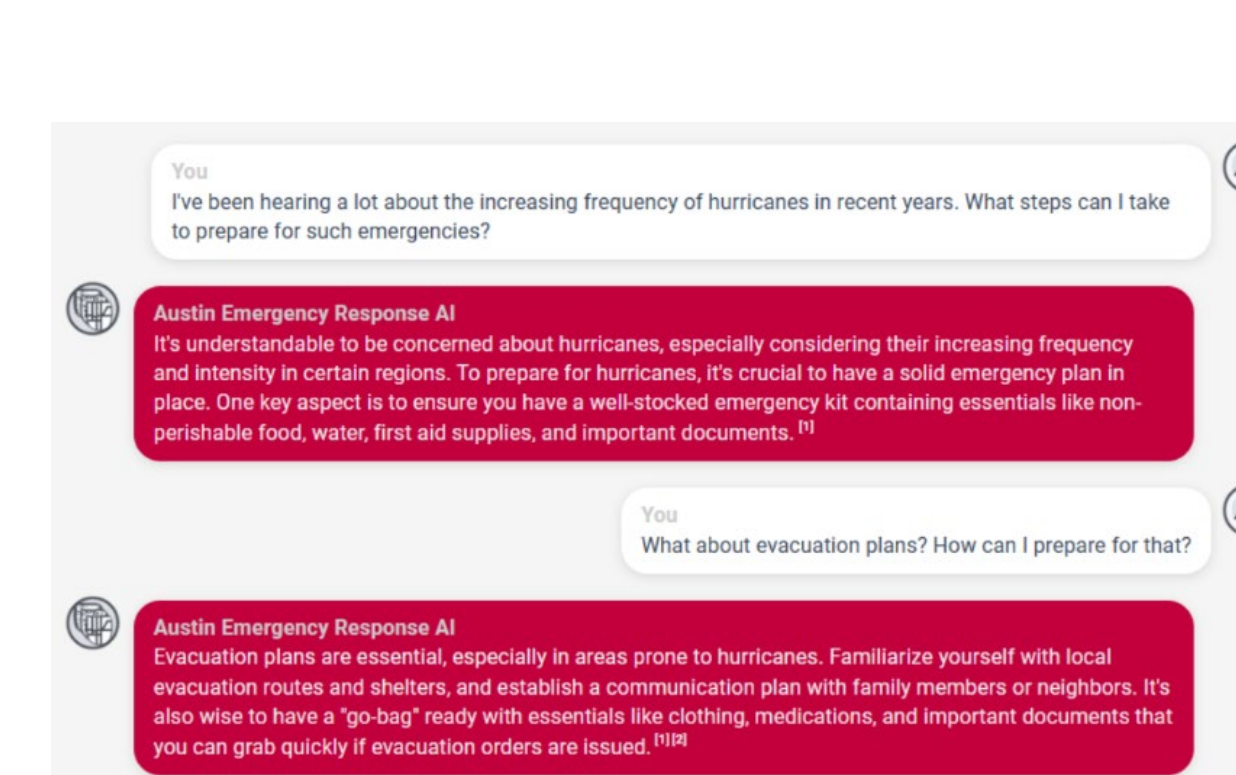


Figure 5: A sample conversation with Austin Emergency Response AI in English about hurricane preparation.



Figure 6: A sample conversation with Austin Emergency Response AI in Arabic, a priority language, about finding shelter during a storm.

## Expected Outputs

Phase 1: survey 1	
Prepare and translate survey and message stimuli	
Pre-test message stimuli	
Recruit participants	
Field survey	
Analyze results	
Phase 2: social media messaging	
Prepare and translate survey and FB ad stimuli	
Pre-test FB ad stimuli	
Field FB ads	
Field FB follow-up survey	
Analyze results	
Phase 3: chatbot messaging	
Create chatbot framework	
Pre-test chatbot	
Field chatbot via SMS	
Field follow-up chatbot survey	
Analyze results	

Figure 7: Project outputs by phase.

Our outputs for this project will include three datasets with survey results for each phase that will be made public on UT and City of Austin open data portals, a presentation of our findings to City of Austin executive leadership and the City's PIO network, as well as sharing of results and insights that incorporate tools to visually represent project responses across City Council districts. The developed Emergency Response AI chatbot will be deployed and free to use for the public.

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## References

[1] Shinya Uekusa, Steve Matthewman. 2023. "Preparing multilingual disaster communication for the crises of tomorrow: A conceptual discussion". International Journal of Disaster Risk Reduction, Volume 87, 103589, ISSN 2212-4209. <https://doi.org/10.1016/j.ijdrr.2023.103589>

[2] Federal Communications Commission, Intergovernmental Advisory Committee. 2019. "Advisory Recommendation No: 2019-5 In the Matter of Multilingual Emergency Alerting." <https://docs.fcc.gov/public/attachments/DOC-360696A3.pdf>

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