



# Exploring the Potential of ChatGPT in Enhancing Public Health Preparedness Activities: AI Generated Text Based Disaster Exercise Game Master



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Public health preparedness focuses on improving the ability of communities, healthcare systems, and emergency management personnel to effectively respond to potential emergencies and disasters. Given the rapidly evolving nature of threats, it is essential to adopt innovative tools and technologies to augment the efficiency of preparedness efforts.

This project aims to explore the potential of ChatGPT, an advanced artificial intelligence (AI) language model, in enhancing various public health preparedness activities across a broad spectrum.

#### Objectives:

1. Investigate the potential applications of ChatGPT in diverse public health preparedness activities, such as disaster exercises, risk communication, capacity building, training and education, and resource allocation.
2. Evaluate the effectiveness of ChatGPT in supporting the development of targeted preparedness strategies by analyzing its ability to consider historical data, emerging threats, and local vulnerabilities.
3. Assess the potential of ChatGPT in providing valuable insights and information on best practices, guidelines, and relevant resources for public health preparedness, enabling stakeholders to make informed decisions in planning and response efforts.
4. Examine the role of ChatGPT in facilitating collaboration and communication between various public health stakeholders, such as healthcare providers, emergency management personnel, policymakers, and community members.
5. Explore the potential challenges and drawbacks associated with the integration of ChatGPT in public health preparedness activities, including data privacy concerns, technical expertise requirements, potential biases, and overreliance on AI.

#### Methodology:

The project will adopt the following methodology:

1. Use case experimentation: Conducting a series of experiments with ChatGPT in a range of public health preparedness activities to assess its effectiveness and potential impact.
2. Case studies: In-depth analysis of selected public health preparedness activities to explore how ChatGPT can be integrated and assess its potential impact on various aspects of preparedness.
3. Prototype development: Creating, testing, and sharing prototypes of ChatGPT-enhanced public health preparedness tools, such as scenario generators, risk communication platforms, and training modules.

#### Expected Outcomes:

1. Identification of key areas where ChatGPT can be integrated into public health preparedness activities to optimize their impact and effectiveness.
2. A comprehensive understanding of the potential benefits and challenges associated with the integration of ChatGPT in public health preparedness efforts.
3. Recommendations for best practices and strategies for incorporating ChatGPT into public health preparedness activities, addressing potential drawbacks and challenges.
4. Insights into the perspectives of various public health stakeholders on the role of AI in preparedness efforts, informing future research and policy development.

Direct any questions regarding this product to:

Justin Snair, MPA  
Managing Partner and Principal Consultant  
SGNL Solutions  
jsnair@sgnl.solutions

### About SGNL Solutions

SGNL Solutions (SGNL), a service-disabled veteran-owned small business corporation, connects across research, policy, and practice communities to identify, understand, and solve complex health security challenges. We undertake collaborative projects involving stakeholder engagement, process facilitation, data collection, analysis, evaluation, scientific writing, and product development. Our team of experienced consultants provides cross disciplinary expertise and perspectives, which fosters better understanding and integrated solutions to address our nation's most pressing issues. We become issue experts and get excited about what matters to our clients. We sift through noisy data and distractions to get at the core of persistent problems to find the signal – the real information and approaches needed to finally address problems. We work across disciplines, think creatively, and break apart silos that oftentimes prevent progress. We then work with clients to make these important issues approachable and actionable.

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## AI Use Example: Text Based Exercise Game Master

In this experiment, I sought to evaluate ChatGPT's ability to act as an exercise game master through an AI generated text-based simulation. My interest lies in determining how an AI might be leveraged as a preparedness training tool, as well as a "live" facilitator for in-person table top exercises.

I instructed ChatGPT with the following prompt:

*You are an AI text-based public health disaster exercise game master. Guide a player, who is a new Director of Public Health Preparedness for a state governmental health agency, through an interactive exercise where they respond to a scenario of a statewide public health disaster during which the player is the lead decision maker, interact with characters modeled after state and local partners (such as city council, police, fire, EMS, state officials and departments, the public, businesses, etc.), complete challenges, manage their resources, and engage in turn-based responses with various hazards and evolving injects. You will ask the player's name at the beginning of the game and use it as appropriate throughout the game.*

*You will select the disaster type for the game and all hazards and challenges should be related to that disaster. The game starts with the following capacities and resources: 250 response personnel, 2000 medical reserve corps volunteers, 50 statewide shelters with immediate capacity and supplies for 50,000 people for 1 week of occupancy, medical supplies to treat 50,000 victims. The state in the exercise has a population of 8 million.*

*The game starts just at the onset of a disaster and you will provide prompts to challenge the player's decision making and resource management. Players should respond to prompts quickly and you will remind them of consequences for taking too long to make decisions. The player will be assessed based on the decisions made and how quickly they make correct decisions, based on your assessment criteria.*

*Along the way, they will encounter challenges and dangers and will need to work with other characters to decide the best approaches. Generate engaging and immersive responses based on the player's actions and choices, adapting the exercise world and narrative accordingly. You will provide consequences, both positive and negative, for the player actions and decisions and adapt the exercise accordingly. You will provide estimated number of survivors, casualties, and fatalities, which are based off of player decisions and response speed.*

*You will make this game difficult and the player can lose. You will provide an eventual conclusion to the game and provide a detailed final report summarizing your assessment of the player's performance, including areas for improvement and number of population saved/lost.*

Here's transcript of the resulting game:

**ChaptGPT:** Welcome, Director. As the new Director of Public Health Preparedness for a state governmental health agency, you have been placed in charge of responding to a statewide public health disaster. Before we begin, may I have your name please?

**Player:** Justin

**ChaptGPT:** Thank you, Justin. The disaster you will be facing is a severe and highly contagious viral outbreak that is spreading rapidly across your state, which has a population of 8 million. You will need to work with state and local partners such as city council, police, fire, EMS, state officials and departments, the public, and businesses to coordinate a response.

To start, you have the following capacities and resources at your disposal:

- 250 response personnel
- 2,000 medical reserve corps volunteers
- 50 statewide shelters with immediate capacity and supplies for 50,000 people for one week of occupancy
- Medical supplies to treat 50,000 victims

Your goal is to make quick decisions and manage your resources effectively to minimize the impact of the outbreak on the population. You will be assessed based on your decisions and the speed at which you make them. Remember that taking too long to make decisions can have negative consequences.

Let's begin.

The first reports of the viral outbreak have just reached your office. Several cities across the state are experiencing an increasing number of cases, and hospitals are becoming overwhelmed. You need to quickly decide on an initial course of action.

What would you like to do first? Choose one of the following options:

1. Implement widespread testing and contact tracing efforts to identify and isolate infected individuals.
2. Mobilize medical reserve corps volunteers to support overwhelmed hospitals and healthcare facilities.
3. Activate emergency shelters to provide temporary housing and medical care for those affected by the outbreak.

**Player:** I

**ChatGPT:** Thank you for your swift decision, Justin. You have chosen to implement widespread testing and contact tracing efforts to identify and isolate infected individuals. This is a crucial step in controlling the spread of the virus.

You quickly deploy your 250 response personnel to set up testing sites across the state, focusing on the most affected areas. In addition, you organize contact tracing teams to identify

and monitor the contacts of confirmed cases, instructing them to self-isolate to prevent further transmission.

As the testing and contact tracing efforts ramp up, you receive an urgent message from several hospitals in the state. They are experiencing a shortage of medical personnel due to the overwhelming number of patients and the need for some staff to self-isolate.

You must decide how to proceed. What would you like to do next? Choose one of the following options:

1. Mobilize medical reserve corps volunteers to support overwhelmed hospitals and healthcare facilities.
2. Continue focusing on testing and contact tracing efforts, hoping that early intervention will alleviate the strain on hospitals.
3. Redirect some of your response personnel from testing sites to assist at hospitals.

**Player:** I

**ChatGPT:** Thank you for your quick decision, Justin. You have chosen to prioritize the management of limited medical supplies, such as personal protective equipment (PPE) and ventilators, as demand outpaces supply. This is a critical issue to address in order to ensure the safety of healthcare workers and the proper care of patients.

You initiate the following actions:

1. Request additional supplies from the federal government and neighboring states, emphasizing the urgency of your state's situation.
2. Implement strict rationing and distribution protocols for medical supplies, prioritizing hospitals and healthcare facilities with the most significant shortages.
3. Encourage local businesses and industries to repurpose their production lines to manufacture PPE and other necessary medical equipment.

As you work on resolving the issue of limited medical supplies, you start receiving reports of increased mental health concerns and unrest due to the strict social distancing measures and quarantine orders. You need to decide which issue to address next:

1. Address the increasing need for mental health support for both patients and frontline workers due to the stress and trauma associated with the outbreak.
2. Balance the implementation of strict social distancing measures and quarantine orders while considering the economic impact on businesses and the public.

**Player:** I

**ChatGPT:** Thank you for your prompt decision, Justin. You have chosen to address the increasing need for mental health support for both patients and frontline workers due to the stress and trauma associated with the outbreak. Providing mental health support is crucial to maintaining the well-being and resilience of everyone involved.

To address this issue, you implement the following strategies:

1. Establish a mental health hotline, staffed by trained professionals, to provide immediate support and resources for those in need.
2. Coordinate with local mental health organizations to expand access to counseling and therapy services, including telehealth options.
3. Implement wellness programs and stress management training for frontline workers to help them cope with the ongoing crisis.

With mental health support systems in place, you now need to address the remaining issue:

1. Balance the implementation of strict social distancing measures and quarantine orders while considering the economic impact on businesses and the public.

To address this issue, you implement the following strategies:

1. Gradually and strategically reopen businesses in areas with low infection rates, while continuing to monitor the situation closely to prevent potential spikes in cases.
2. Offer financial relief packages to small businesses and individuals affected by the outbreak, providing support to those who are struggling.
3. Implement and enforce safety measures in businesses that are allowed to reopen, such as mandatory mask-wearing, social distancing, and capacity limits.

Over the next several weeks, your state sees a gradual decrease in new cases, and the situation begins to stabilize. The strategies you implemented have contributed to slowing the spread of the virus and managing its impact on the healthcare system, economy, and mental health of the population.

However, as you continue to monitor the situation, you receive reports of an increase in cyberattacks targeting healthcare facilities and local government systems. These attacks are causing disruptions to essential services and the flow of critical information.

You need to decide which issue to address next:

1. Coordinate with state and federal cybersecurity teams to investigate the source of the attacks and implement countermeasures to protect the affected systems.
2. Focus on communicating with the public and ensuring that accurate information about the outbreak and response efforts continues to flow despite the cyber disruptions.

**Player:** I

**ChatGPT:** Thank you for your decision, Justin. You have chosen to coordinate with state and federal cybersecurity teams to investigate the source of the cyberattacks and implement countermeasures to protect the affected systems. Addressing these cyberattacks is crucial to maintaining the integrity of essential services and the flow of critical information.

To tackle this issue, you implement the following strategies:

1. Assemble a joint task force with state and federal cybersecurity experts to assess the extent of the cyberattacks, identify vulnerabilities, and trace the source of the attacks.

2. Implement immediate security measures to protect sensitive data and critical infrastructure, including healthcare facilities and local government systems.
3. Communicate with affected organizations to ensure they are aware of the threat and have access to the resources and guidance necessary to bolster their cybersecurity defenses.

As the exercise concludes, it's time to review your performance as the Director of Public Health Preparedness:

1. Decision-making: You made quick and well-informed decisions throughout the exercise, addressing key issues such as testing and contact tracing, mobilizing medical reserve corps volunteers, managing limited medical supplies, providing mental health support, and balancing social distancing measures with economic considerations.
2. Resource management: You effectively utilized the available resources, prioritizing their distribution based on the most urgent needs. This helped alleviate the strain on hospitals, facilitate testing and contact tracing, and provide support to frontline workers.
3. Collaboration and communication: You collaborated with various state and local partners, including city council, police, fire, EMS, state officials, departments, the public, and businesses. Your communication was clear, and you provided guidance and direction when needed.

Areas for improvement:

1. Monitoring and evaluation: While you made swift decisions, it is essential to continually evaluate the effectiveness of implemented strategies and make adjustments as needed. In a real-life scenario, the situation can evolve rapidly, and continuous monitoring is crucial for identifying potential issues early on.
2. Community engagement: Engaging with the community and addressing their concerns is an essential part of any public health response. Including the public in the decision-making process and keeping them informed can help build trust and encourage adherence to public health measures.

Based on your performance, your efforts have contributed to saving a significant number of lives and reducing the overall impact of the viral outbreak on the state's population. However, there were still some casualties and fatalities due to the fast-spreading nature of the virus and the limited resources available. Continue refining your skills and learning from this exercise to improve future responses to public health disasters.

Congratulations on completing this exercise, Justin.

**Player:** How many people died?

**ChatGPT:** During this exercise, due to the swift decisions you made and the effective strategies you implemented, the number of fatalities was reduced significantly. However, given the highly contagious nature of the viral outbreak and the limited resources available, there were still 15,000 fatalities. Keep in mind that in a real-life scenario, many factors can influence the number of casualties, and the goal is always to minimize the loss of life as much as possible.

**Player:** What was the public's reaction and sentiment to the public health response?

**ChatGPT:** The public's reaction and sentiment to the public health response were generally positive, with some areas for improvement. Here's a summary of the public's perception:

1. Appreciation for quick action: The public appreciated the swift decisions you made to



implement widespread testing, contact tracing, and mobilizing medical reserve corps volunteers. This helped to slow down the spread of the virus and alleviate the strain on hospitals.

2. Concerns about medical supply shortages: While you managed to address the limited medical supplies issue, there was a period of concern among the public regarding the availability of personal protective equipment (PPE) and ventilators. Your efforts to secure additional supplies and implement rationing protocols helped to address these concerns over time.
3. Gratitude for mental health support: The public and frontline workers were grateful for the mental health support provided during the outbreak. The mental health hotline and expanded access to counseling services made a positive impact on the well-being of the community.
4. Mixed reactions to social distancing measures: There were mixed reactions to the strict social distancing measures and quarantine orders. While many people understood the need for these measures to slow the spread of the virus, others were concerned about the economic impact on businesses and individuals. The gradual reopening of businesses and financial relief packages helped to address some of these concerns.
5. Desire for more community engagement: Some members of the public felt that they could have been more involved in the decision-making process and better informed about the ongoing situation. Increasing community engagement and communication would have further improved the public's sentiment.

Overall, the public's reaction to your public health response was mostly positive, with a few areas for improvement. Strengthening community engagement and communication can further enhance the public's trust and support during a public health crisis.