
TSA Pre Health Check¹

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Abstract

In an era where global interconnectedness accelerates the spread of infectious diseases, timely detection and mitigation of outbreaks is critical to preventing pandemics. Our novel solution, is the TSA Pre Health Check. This innovation leverages real-time health data to identify potential disease carriers in transit, offering a preventative measure at major transportation hubs. The TSA Pre Health Check system collects anonymized health surveys from travelers, which are analyzed using machine learning algorithms to identify localized outbreaks. This data can then be mapped geographically, offering early warnings that enable targeted responses before outbreaks escalate.

Keywords: AI, Diseases, Pandemic

1. Introduction

The rapid global movement of people and goods has made the prevention of disease outbreaks more challenging than ever. Existing approaches to managing public health risks at borders are often reactive, lacking real-time monitoring that could help detect potential health threats earlier. The TSA Pre Health Check proposes a proactive, AI-driven approach to this issue, utilizing machine learning to assess and monitor health risks among travelers at major transportation hubs. Unlike conventional methods, which typically involve passive screening or manual assessments, our solution integrates AI-based disease prediction and assessment tools to identify potential carriers of infectious diseases through anonymized health surveys. This enables immediate, geographically-targeted health alerts and facilitates quicker, more effective responses. By incorporating real-time health

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insights into existing transportation security processes, the TSA Pre Health Check holds promise not only for enhancing public health safety but also for establishing a scalable model that could influence future AI policies in public health risk management.

2. Methods

We used the majority of the logic and approach using OpenAI's models. The first thing we used is for passport analysis which parses out the relevant information needed to identify travelers. Our current approach uses OpenAI's AI for the majority of our disease analysis, AI will generate questions based on where the traveler has been to and makes questions based on the most relevant local diseases that can be present. Then after traveler answers the survey to the best of the ability, the AI will assess the answers given by the traveler and produce a key metric which displays their vulnerability of the an infection or disease. Since OpenAI has been trained on real world data, it will provide very accurate questions and results based on current disease research in all countries.

3. Results

Using AI to parse out relevant information with passports has been a use success even with low quality images. It is able to parse out all of the necessary information that we've requested to parse out. The disease analysis and questions were very effective as well. Here we show the output of the questionnaire answers

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{"rating": 8.5, "reason": "The combination of fever, persistent cough, and occasional contact with sick individuals raises concerns about potential exposure to serious infectious diseases prevalent in Africa, such as malaria, tuberculosis, or even COVID-19. Fever and cough are common symptoms of these diseases, and the intermittent contact with sick individuals increases the risk of transmission. Fatigue, though occasional, can also be a symptom of these infections. Immediate medical evaluation is recommended."}
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The country in question was Africa and the questions and answers are:

"Have you experienced any fever? Yes. Do you have any cuts or wounds? No. Have you had contact with sick individuals? Sometimes. Do you have a persistent cough? Yes. Are you currently experiencing fatigue? Sometimes."

The output gave a rating which is on the severe scale and it gives a reasoning of the score selection as well. We believe the output was very reasonable with the answers that the travelers give, if the traveler can provide more information, the more in-depth analysis the AI can do.

4. Discussion and Conclusion

We believe this solution will revolutionize and mitigate the spread of diseases in the real world and prevent future large scale pandemics. Our challenges included the time restraint, we would love to implement so much more features to this application, but we had to scale down due to the time. We also had issues with using OpenAI's API and learning how to use it was a huge learning curve. We want this to be integrated with currently how TSA runs at the airport, if we can stop diseases before they get on a flight with a traveler we are successful in stopping a possible world wide pandemic. We do not hope for another COVID-19 in the future ever again.